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EDITORIAL.

Contributions and correspondence regarding subjects affecting the farming industry of Southern Rhodesia are invited. All communications regarding these matters and advertisements should be addressed to:—The Editor, Department of Agriculture, Salisbury.

Matopos School of Agriculture.—Owing to structural alterations which are necessary to provide accommodation for the agricultural students in view of the establishment of a preparatory school, under the Department of Education, at Matopos, it has been decided that the first term this year will commence on Monday, 1st February, 1932, instead of 18th January, as previously arranged.

Full particulars regarding courses, fees, etc., may be obtained from the Director.

Soil Erosion.—Owing to the reduction of staff, the Irrigation Division urges that farmers requiring advice on soil erosion should send in their names as early as possible in order that tours may be efficiently arranged. This applies particularly to farmers who wish to obtain advice on levels

for contour ridges during March or April, when green manure crops have been ploughed in. Not only is the excavation more cheaply done when the ground is *soft*, but a more even distribution of the work over the season is obtained, thereby assisting both the farmers and the engineer.

Rotary Cultivation.—Mechanical power applied to agriculture has brought into being new possibilities in soil cultivation. This is illustrated by the recent development of so-called rotary cultivation, which was predicted more than sixty years ago by Hoskyns, and is now an accomplished fact and is being tested at Rothamsted Experiment Station. The main idea is that the rotary motion of an engine need no longer be converted into a straight *pull*, but can be communicated direct to a rotating shaft carrying tines. In this way the movement which loosens the soil also helps the machine forward. It would appear from tests already completed that the physical conditions of the soil worked with a rotary cultivator are different from those produced where the ordinary methods of ploughing and harrowing have been employed, but it will be necessary to test these effects on a large variety of soils before any definite statement can be made.

Milk Recording Scheme.—*A system of milk recording* has been in force in this Colony for the past three years, and it is gratifying to note that the service has become very popular with dairy farmers both for pedigree herds and for grade dairy herds. It has been decided to maintain the two recorders and to extend the service as far as it is practicable without any additional increase in staff. To make this possible it has been found necessary to reorganise the semi-official recording scheme, that is the scheme dealing with grade cows, on a bi-monthly basis.

The regulations governing the milk recording of both pedigree and grade dairy herds are published in this issue.

It is *essential* that the *official scheme should be dealt* with by the recorder monthly and that the service should be looked upon as a permanent one. In the case of grade

herds, however, it may be necessary to withdraw the services of the recorder after two or three years, when the farmers concerned will have to carry on the recording themselves, so as to enable new herds to be brought within the scheme.

High Speed Gas Producer.—A cheap form of power for farm use is one of the most urgent requirements of most African territories, including Southern Rhodesia. Where tsetse fly exists the demand is even more pressing, and it is essential that the power must be adaptable to tractors and lorries for farming operations and transport where it is impossible to maintain oxen.

The Department of Agriculture has been watching the attempts to supply a cheap form of power for agricultural purposes for many years, and has investigated every case where definite progress has been claimed. During the last five years several demonstrations have been arranged, but in every case the results have been more or less disappointing. The latest developments with the plant designed and patented by Major J. A. Macdonald, of Kenya Colony, appear to be far ahead of anything which has yet been tried, and we welcome the opportunity which was given to Mr. B. G. Gundry, of the Irrigation Engineer's staff, to investigate the working and general performance of the plant. The report is published in this issue and will undoubtedly be of general interest.

The Raising of Bacon Pigs.—For the last few years the number of European-owned pigs in this country has only increased to a very small extent. This position is undoubtedly due to the limited character of the local markets and the absence of export facilities. In the Union of South Africa the number of European-owned pigs has actually decreased during the last five years, probably for similar reasons.

Attempts to export bacon and pork have so far not been a financial success, but the results of small consignments have indicated that South Africa can produce bacon of the quality required by the English market, but it is undoubtedly true that the consignments which were so well commented

on in London were specially selected and not of the usual type produced.

If any large increase is to be possible it will only be in view of an export market, and before this can be done the type of bacon pig throughout the Colony must be improved.

The first part of an article indicating the requirements and the lines on which the desired results may be obtained appears in this number of the Journal, and will be concluded by a second section in the next issue.

This should be of particular interest to farmers throughout the Colony, and any further information which may be desired on the subject may be obtained from the Senior Animal Husbandry Officer of the Department.

Tobacco to Control Round-worm in Poultry.—Adding tobacco to the rations fed to poultry to prevent round-worm trouble has been tried experimentally at the Pennsylvania Experiment Station for the past two years.

During 1930 two hundred day-old chicks were divided into five groups and placed in battery brooders. Group I. served as a control and received no tobacco. The remaining four groups received tobacco in the mash as follows:—

Group II., 0.2 per cent.;
Group III., 0.4 per cent.;
Group IV., 0.8 per cent.; and
Group V., 1.2 per cent.

These figures are based on a tobacco dust analysing 5 per cent. nicotine. During the first few weeks of their lives each bird received approximately 15,000 round-worm eggs. These eggs were incubated and administered just before the worms were ready to hatch. The birds were killed and post-mortem studies were made about 10 weeks after infestation. Seventy-eight per cent. of the birds in Group I. (the control) were infested. Five per cent. of the birds in Group II. were infested, but no infestation could be observed in Groups III., IV. and V. This work is still in the experimental stage, and no recommendations regarding the practical use of this type of product can be made at the present time.

An Experiment on the Transport of Chilled Meat.—During December an interesting experiment was carried out to determine the possibility of chilling and transporting meat with the facilities at present available in the Colony.

The preliminary organisation of the trial was undertaken by Major Gordon with the purpose of demonstrating the practicability of shipping chilled meat from Bulawayo to the United Kingdom. Major Gordon was able to collect sufficient funds from interested farmers to purchase 18 bullocks, to which number a further 2 were donated by the Matopos School of Agriculture, making a total of 20 head.

The cattle were slaughtered at the Rhodesia Export and Cold Storage Co., Ltd. The carcases were then chilled, placed in one of the new type refrigerator trucks and shipped over the Rhodesia Railways to Umtali and back to Bulawayo. The return journey took 3½ days. Half the carcases were then returned to the Cold Storage and the remainder left in the truck. Both lots were then maintained at chilling temperature (28-30 degrees F.) for 25 days. The combined period of 28 days is well over the time within which (21-22 days) it is possihle now to ship chilled beef from Bulawayo to the United Kingdom.

Close records as to the temperature and keeping qualities of the meat were made at frequent intervals by officials of this Department. At the end of the 28-day period all the carcases were inspected and reported on by the heads of two Bulawayo butcheries and by members of this Department. Some of the meat was then distributed to hotels and private individuals in and around Bulawayo for cooking trials and report.

The reports in regard to the keeping and cooking qualities of the meat were very satisfactory as judged from local standards. It is probable, however, that considerable improvement would have been required in the case of some sides to meet Smithfield requirements. The meat, however, had a severe trial. Owing to minor practical difficulties, which should be easily overcome in the future, the temperature variations were too large to produce the best results. Under the circumstances, however, the results can be considered very satisfactory, and show that, with proper

precautions, there should be little technical difficulty in shipping chilled meat to England.

It should be mentioned that the Rhodesia Export and Cold Storage Company and the Rhodesia Railways carried out their share of the experiment free of cost.

What are the Fertiliser Requirements?—It is usual in present day fertiliser catalogues to indicate composition under three main headings:—

(a) phosphoric oxide;

(b) nitrogen; and

(c) potash.

In addition to these, agricultural lime is usually quoted as being necessary to correct soil acidity, to improve the physical condition and to release other plant foods from the reserve supply in the soil. This reflects the correct view that these are the most important plant foods required, and that as a rule the soils, fertilisers and farm-yard manure supply sufficient of the other mineral elements for the profitable production of crops.

If asked what other elements were essential, the reply, until recently, would have been magnesium, sulphur, carbon, hydrogen, oxygen, iron, chlorine and silicon. Recent researches, however, have indicated that some of the less common elements prove to be of the greatest importance in the nutrition and growth of both animals and plants. On certain types of soils, for instance, it has been definitely shown that the absence of manganese accounted for a diseased condition of plants which could not be corrected by ordinary fertiliser treatment, but which was entirely overcome by the application of small doses of manganese snlphate to the acre. Experiments with copper, zinc, barium and boron in very small amounts have indicated that remarkable plant response may be obtained from their use on varying types of soils. Copper is perhaps the most striking. It would appear to be the case, although not conclusively proved as yet, that a physiological disease of citrus trees known as "die-back" may be remedied by the application of

a very light dressing of copper sulphate. This is an interesting fact, and the remarkable stimulative effects upon the soil obtained by spraying plants growing in certain soils with Bordeaux mixture—a mixture of copper sulphate and lime—are often attributed to the effect of the copper. The credit, however, as far as the soil is concerned, should, we think, be given mostly to the lime.

Boron, in very minute quantities, is essential for plant development and for the production of fruit. One investigator, working with broad beans, found that best results were obtained with quantities of approximately one part of boric acid per million of the culture solution. This illustrates a fact which is extremely important in applying all the more unusual elements. Very minute quantities are essential, but any excess over the essential amount may be harmful and cause complete crop failure.

HANDBOOK OF TOBACCO DISEASES.

Attention of readers is drawn to the fact that the Department of Agriculture has found it most inconvenient, with the present shortage of staff, to handle the local sales of this book. Arrangements have therefore been made with the Rhodesian Printing and Publishing Company for distribution by them throughout Southern Rhodesia. The book may be obtained from the Herald Store, Salisbury, price 4s., or, postage paid, 4s. 4d.

THE RAISING OF BACON PIGS.

By A. E. Romyn, Senior Animal Husbandry Officer; and C. A. Murray, Lecturer in Animal Husbandry, Matopo School of Agriculture;

With a Veterinary Section by D. A. Lawrence, Veterinary Research Officer.

Introduction.—It seems necessary these days to preface any article on pigs with a statement as to the economic position of the industry.

The pig industry in South Africa has not grown during the last few years. This lack of progress is due chiefly to the relatively poor quality of most of the pigs produced and *to the limited character of the local market, which, in the* absence of an organised export trade, is easily over-supplied. Periods of over-supply have occurred at regular intervals during the last decade, and the resultant low prices at each of these periods have discouraged production and prevented permanent growth in the industry. The relative stagnation in numbers is plain from the following figures:—

NUMBER OF EUROPEAN-OWNED PIGS IN THE UNION OF SOUTH AFRICA AND SOUTHERN RHODESIA.

Year.	Union of South Africa.	Southern Rhodesia.
1925	528,085	20,156
1926	613,520	20,385
1927	569,447	19,981
1928	550,521	21,102
1929	513,439	23,490
1930	—	25,536

Attempts to export bacon and pork to relieve the situation have so far not been a financial success. Isolated small consignments of bacon have been well commented on in England, and prizes have been won at the London Dairy

Show. While these results indicate that South Africa can produce bacon of the quality desired, the low grade of most of the bacon produced here and its relatively high cost of production have prevented the trade from going ahead.

South Africa is well suited to the raising of pigs, and records of the industry show that during the last decade the consistent pig farmer has made profits from pig keeping which compare favourably with other agricultural enterprises. There is no reason why this type of farmer should not continue to make similar profits in the future.

It is now generally realised that there will not be a stable local market for pigs until an export trade is developed. Recent developments in the transport of mild-cured bacon and the improvement in the quality of the pigs, which has occurred during the last few years, make the prospects for such a trade much more hopeful than they have been. In this connection the efforts now being made in the Union to organise the pig industry and develop an export trade should be closely watched by farmers in this Colony.

There are difficulties ahead, but the materials are available to build up a relatively important industry. The success of the enterprise will, however, depend upon the ability of producers to meet the requirements of the English market and on their success in reducing production costs. The efficient producer should be able to do both.

THE BACONER.

The Type of Pig Required.—Certain parts of a bacon side are more in demand and have a higher value than other parts.

The relative wholesale prices for the different parts of the bacon side are shown in Figure I. It will be noted that the valuable parts are the middle and the hams. The fore end is of much less value.

The desired type of pig is one which has the maximum development *in the valuable parts, and pigs of the desired* quality and conformation are either known as "select" or "prime" baconers. They have the following characteristics:

(a) **Conformation.**—*Great length* between the shoulder and ham. The back should be slightly arched and be of

medium and uniform width from rump to shoulder. The sides should not be too deep, but of *uniform depth* from chest to flank. The shoulder should be as *light* and *fine* as possible, showing no signs of coarseness and blending *smoothly* with the sides. The *finer* and *lighter* the jowl and neck the better, as these parts have relatively little value. The hams, being the highest priced part of the carcase, should be *well developed*, *broad*, *plump* and *well let down* to the hocks. The underline should be *firm*, *full* and show *no* signs of flabbiness.

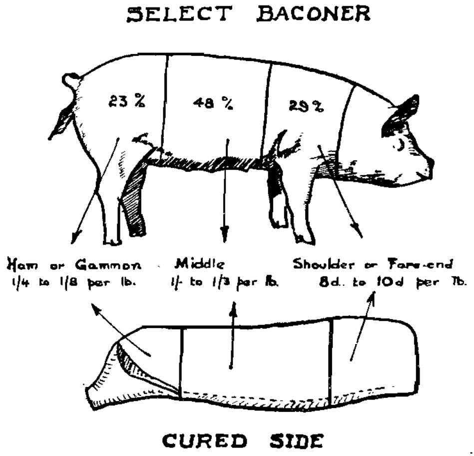

Fig. I. Relative wholesale values for different parts of the side.

A baconer should give one the impression of a long, lean, well-fleshed pig showing no excessive tendency to lay on fat. The short, broad, deep, lard type of pig should be avoided altogether. Figure II. illustrates the correct type.

(b) **Quality.**—It is of importance that the baconer should show *quality* and *thriftiness.* A *thin*, *smooth* skin and *fine* covering of hair indicate these. Any sign of

coarseness, such as is found in a heavy shoulder, wrinkled skin and rough hair, is most undesirable.

(*c*) **Finish.**—When marketed the baconer should be *well finished*, i.e., the back, sides and underline should be well filled and have a *smooth* and *full appearance*. The back fat of an unfinished pig is generally too thin and soft, and the whole carcase has a flabby appearance. The over-finished pig, on the other hand, is too fat for the production of the best quality bacon.

(d) **Correct Weight.**—The weight at which to market a bacon pig depends on the type of pig. The longer the pig, the heavier is the weight to which it has to be fed to secure a proper finish. The shorter the pig, the lighter is the

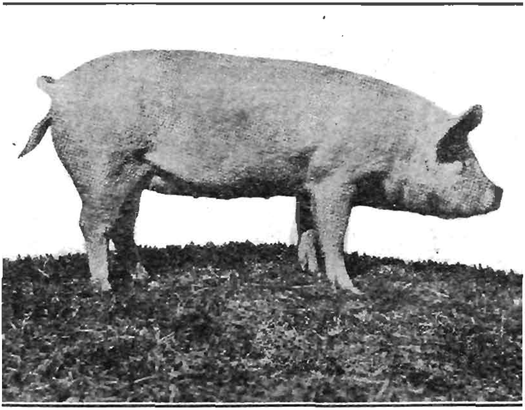

Fig. 11. A select Baconer.
(From Pamphlet No. 40, Canadian Department of Agriculture.)

weight at which it can be marketed. Experiments in the Union of South Africa have recently shown that *long baconers* of the Large White x Large Black cross usually have the desired finish at from 200 to 215 lbs. farm weight, and short ones of this cross at from 185 to 200 lbs. A short baconer

of this *cross* at 210 lbs. will definitely be over fat. A long one, on the other hand, at 190 lbs. will be unfinished. It requires careful judgment to determine the correct degree of finish for marketing.

The Type of Carcase Required.—After the pig has been killed, bled, scalded, scraped and singed, the entrails, heart, liver and lungs are removed. The carcase then is weighed to obtain the dressed weight of the pig. This weight should be from 75 per cent. to 80 per cent. of its weight before slaughter. The carcase is then split and the backbone, head, tail, leaf fat, tenderloin, kidney fat and kidneys are removed. The two sides are now separate, and it is not until this stage that a reliable judgment can be made as to the suitability of the pig for bacon production. Figure III. shows desirable and undesirable bacon carcases.

The side should have a well-proportioned appearance. It should be *long* from ham to shoulder, light in the shoulder, and have a *full, plump* ham.

There should be an *even* covering of back fat, not exceeding 2¼ ins. over the shoulder and tapering slightly from shoulder to ham. An *uneven* layer of too *thick* or too *thin* back fat is a very serious fault. The belly and flank should also be *thick* and *full* of substance. There should be no signs of seedy cut (see next section), and the side should show no signs of bruises, boils, spots or cuts.

The following are some common carcase defects:—

(a) **Deficient Length.**—Not only is it desirable to have a long middle because of the relatively high value of the bacon obtained from it, but a short pig usually has other undesirable features, such as too much fat and heavy shoulders.

(b) **Back Fat too Thick or too Thin, or Uneven.**—These faults are among the most serious that a bacon carcase can have. At present the demand is for lean bacon, and too much fat is seriously discriminated against. An unfinished carcase, on the other hand, with too thin back fat, produces a soft, flabby side unsuitable for bacon production.

(c) **Heavy Shoulders.**—This part of the carcase has the lowest value per pound. A heavy shoulder is also generally associated with two other serious defects, viz., deficient length and too much fat.

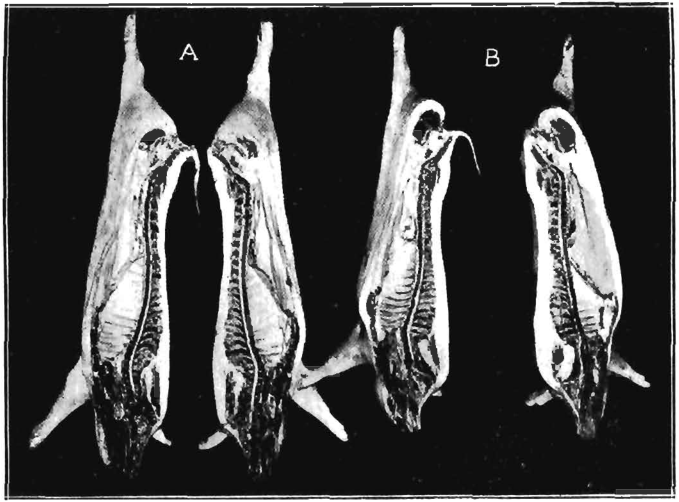

Fig. III A. A desirable carcase with good length.
B. An undesirable carcase, short and too fat.
(From Economic Report No. 17, Ministry of Agriculture and Fisheries.)

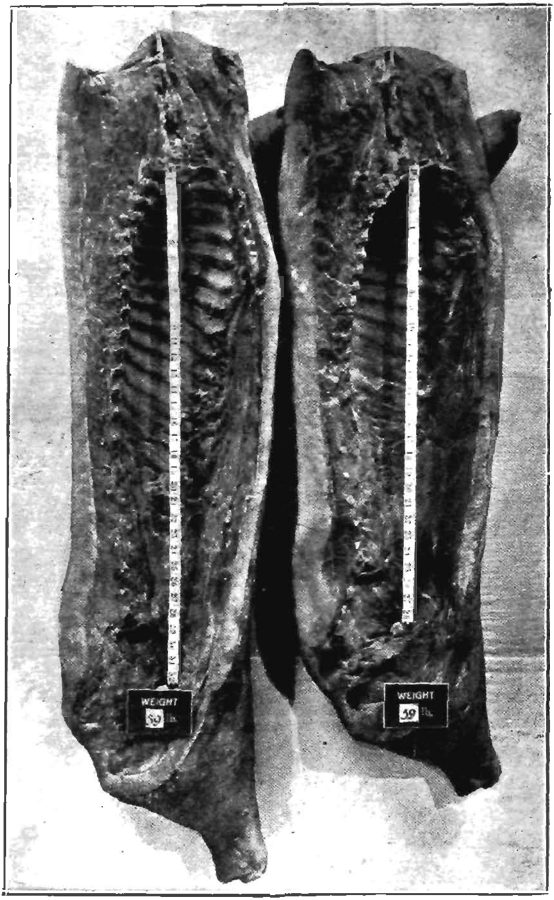

Fig. IV. Desirable and undesirable sides of the same weight. The shorter side is over-fat and is too heavy in the fore end.

(From *Economic Report* No. 17, Ministry of Agriculture and Fisheries.)

(d) **Thin Bellies.**—These are undesirable because of the flabby appearance they give to the carcase and the unsatisfactory rashers that are cut from them. Unfinished, badly bred and unthrifty pigs usually suffer from this defect.

(e) **Soft Fat.**—A soft carcase soon goes rancid. It has an oily and flabby appearance and is most undesirable. Unthrifty, slow maturing, unfinished pigs generally have soft fat. The feeding of peanuts, soy beans and sunflowers produce the same effect. Early maturing, thrifty, well-finished pigs are generally firm.

(f) **Seedy Cut,** found in the belly fat of pigs, is due *to an infiltration of the skin pigment,* and *has a speckled* appearance resembling small seeds. It is only visible in black pigs. Although in no way harmful, the discoloration spoils the appearance of the bacon and often results in the cutting out of large pieces of belly bacon to be used for rendering into lard.

(g) **Meat of Poor Quality.**—Some breeds or crosses produce coarse meat. The lean meat of an unfinished pig will usually be poorly marbled. Good quality meat is well marbled, light in colour and has a fine grain. Black pigs have darker coloured meat than white pigs. Generally, well bred and fed pigs have good quality lean meat.

(h) **Blemishes.**—Bruises, boils, cuts or spots on the carcase constitute blemishes and detract greatly from the general appearance and value of the carcase. Rough handling is the usual cause.

Factors which influence the Value of a Pig for Bacon Production.—The two most important factors are breeding and the feeding and management of the pigs.

(1) **Breeding.**—Certain types and breeds of pigs are unsuitable for production of lean, sizeable bacon. They may be *too fat, too heavy in the jowl or shoulder, too thin in the* belly or too light in the hams. Such types or breeds should not be used for bacon production. Even in the typical bacon breeds—Large Whites and Tamworths—we often find sows which produce pigs that are "off-type" and unsuitable for bacon production. Boars and sows which produce such pigs should be culled immediately from the breeding herd. Figure IV. shows desirable and undesirable sides.

The Characteristics of Different Breeds and Crosses.—There are two recognised distinct types of pigs: the lard (or fat) type and the bacon type. There is, however, an intermediate type which falls between these two extremes. A typical lard pig is short, wide and deep in the body, short on the leg and shows fatness throughout. A pig of the bacon type has, on the other hand, more length than the lard pig, and stands higher on the leg. It is of medium width and depth of body. The bacon type shows relatively little fat and has a decided tendency to leanness.

In Southern Rhodesia the different types are represented by the following breeds:—

Lard Type: (1) Berkshire; (2) Middle White.

Bacon Type: (1) Large White; (2) Tamworth.

Intermediate Type: Large Black.

In Canada the Berkshire has, by selective breeding, been changed to the bacon type, and in England a large percentage of the Middle Whites are also of the bacon type. In Southern Rhodesia, however, both these breeds are of the lard type. In this connection it may be pointed out that "type" within any of the breeds is not definitely fixed, and *must be maintained by selection. Thus it is that, although* the Large White and Tamworth breeds are of the bacon type, we often find sows or boars which throw progeny which are "off-type." Similarly, a Berkshire or Middle White sow may have progeny, some of which resemble the bacon type.

Suitability of the Different Breeds and Crosses for Bacon Production.—Recent investigations in the Union of South Africa on the suitability of the different types and breeds of pigs for bacon production have shown that—

(a) Berkshires or Middle Whites, either pure or crossed with any other breed or type, are generally unsuitable for bacon production because of their excessive fat, deficient length of side and heavy shoulders. The breeding of Berkshires or Middle Whites or their crosses for bacon production is therefore not recommended.

(b) The Large White and the Tamworth, either pure or crossed with each other or with the Large Black sow, produce the most suitable type of baconer. The Large White

x Large Black cross is superior to the Tamworth x Large Black cross, except in areas where white pigs suffer from sunburn and *cannot* be given sufficient shade to prevent sun scald.

(c) The pure Large Black is generally unsuitable for bacon production on account of its tendency to produce coarse flesh and inferior bacon conformation. The Large Black sow is, however, retained for crossing with the Large White and Tamworth boars on account of its availability and its hardy, prolific and motherly qualities.

(2) **Feeding and Management.**—"Feeding" and "management" are as important as "breeding" in the production of select baconers, and a well-bred baconer, if wrongly fed and managed, will not develop into a select pig, although it may have the inherent ability to do so. Wrong feeding and management may result in soft fat, too thick or too thin and uneven back fat, slow maturity, expensive gains, poor quality meat, stunted, unthrifty and poor type pigs.

Common Errors in Feeding and Management.—The following practices should be guarded against:—

(a) *Under-feeding and the use of Unbalanced Rations.*—These result in slow growing, stunted, unthrifty pigs that make expensive gains. Bad feeding may cause the fat to be soft and the carcase to be of poor quality. Usually the faster the pig grows the cheaper it is to produce and the better the quality of its meat.

(b) *Incorrect Finish.*—An unfinished pig is undesirable, and usually produces a flabby carcase with soft fat, a thin belly and poor quality meat. It is of importance to feed the pig until it has the correct finish without allowing it to get over-fat.

(c) *The Use of Excessive Fattening or Oil-Containing Feeds.*—Some feeds should not be used for bacon pigs. Kaffir corn has a tendency to produce too much fat. Peanuts, soy beans and sunflowers produce soft, oily fat, and should not be fed to baconers.

(d) *Poor Housing, Bad Sanitation, etc.*—These all tend to impair the general health and well being of the pig, and so prevent it from growing out economically or producing

the quality of bacon which it is capable of doing under proper conditions.

THE BREEDING HERD.

Selection.—Particular attention should be paid to the selection of stock for the breeding herd, as on their suitability or otherwise will depend to a large extent the success of the business. The pigs selected should be typical of the breed, pure-bred, and, if possible, registered. Cross-bred or grade-pigs should *not* be used. Breeding stock should not be selected too young. The boar should not be chosen under six months or the gilts under three to four months of age. Even at these ages it is hardly possible to form an accurate estimate of their future development. It is important to select the breeding pigs from sows that are known to have *produced* and *reared* large uniform litters of the *correct* type.

The head, conformation and carriage of the boar should show *character* and *masculinity* without being coarse. The sows should show *femininity*, *character*, and *no* signs of masculinity. Both sexes should have *good* length, be relatively *fine* and *light* in the shoulder and jowl, *strong* in the back, with a slight arch from the shoulder to the rump. The ribs should be sufficiently well sprung to indicate constitution, and the sides should be smooth, and blend well with the fore- and hind-quarters. The hams should be full, well developed and well let down into the hocks. The legs should be short and strong and particular attention should be paid to the pasterns, which should be strong and straight. There should be evidence of *quality* throughout. Quality is indicated by a smooth, clean-cut appearance, a fine skin, fine silky hair, fine bones and light shoulders.

The sow should be of a *quiet disposition*, as a nervous and irritable sow often kills a large proportion of its progeny, and is seldom a good doer. The udder should be sound and there should be not less than six pairs of well-developed teats. In the gilt the teats should be well developed and not have the appearance of small "buttons." Hard lumps in the udder and blind teats should be watched for in a mature sow.

The Breeding Age.—The best age at which to breed young gilts will depend on their development. Well-developed gilts, weighing 200 to 250 lbs. and over at eight

months of age, can be put to the boar. A gilt bred too young or before it has developed sufficiently can only rear properly two or three piglets. This small number will not only affect her udder development, but will also greatly increase the cost of production of the young pigs. If such a gilt is allowed to rear larger litters the strain may permanently stunt its growth and spoil it as a breeder. On the other hand, some pure-bred breeders allow their gilts to grow too old and over-fat before breeding them. This is usually the case with show pigs, and it is an undesirable practice, because it increases the cost of the young pigs and may even cause temporary or permanent sterility in the sow.

Under average conditions it is unwise to use a boar until it is a year old. It should be used sparingly at first. Experience has shown that over-use of the boar pig will frequently injure its future breeding powers.

The Gestation Period.—The usual period between successful service and farrowing is from 114 to 115 days, or *about "three months, three weeks, three days."* The following gestation table gives the date of farrowing for sows served on certain dates:—

Gestation or Breeding Table.

Date served.	Date due.	Date served.	Date due.
January 1.	April 25.	July 1.	October 23.
January 16.	May 10.	July 16.	Nov. 7.
February 1.	May 26.	August 1.	Nov. 23.
February 16.	June 11.	August 16.	Dec. 8.
March 1.	June 23.	Sept. 1.	Dec. 24.
March 16.	July 8.	Sept. 16.	January 8.
April 1.	July 24.	October 1.	January 23.
April 16.	August 8.	October 16.	February 7.
May 1.	August 23.	Nov. 1.	February 23.
May 16.	Sept. 7.	Nov. 16.	March 10.
June 1.	Sept. 23.	Dec. 1.	March 25.
		Dec. 16.	April 9.

Breeding Season.—The sow, if properly fed, comes on heat every three weeks, unless she is pregnant or nursing a litter. The period between heats is about three weeks (21 days), although it often varies from 18 to 23 days. The "heat" usually lasts for three to four days, and as the ova

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are usually shed about 30 to 35 hours after the beginning of heat and do not retain their vitality for more than a few hours, the sow should be served during the first or second day of heat. Where market conditions are secure, it is usually the best practice to have all the sows farrow at more or less the same time. A sow on heat will show a swelling of the vulva and general excitement, and will follow other females about. The condition of the boar and sow at service have an important effect on the number of young born. The sow should be in improving condition and the boar in a vigorous, active state.

Number of Litters per Year.—The more young pigs a sow produces and rears successfully per annum the lower will be the cost of production of the weaners. The object should be to get as many litters in as short a time as possible. To let a sow rear one litter and then "board" her for the rest of the year is bad economy. The optimum to aim at is two litters per year. This number, however, will be a heavy drain on the sow and she should therefore be well fed and cared for while nursing and during pregnancy. To obtain two litters per annum the young must be weaned at eight weeks of age and the sow served when she comes on heat, four to six days after weaning.

Size of Litters.—Some sows will farrow up to and over 20 piglets at a time. A sow usually has 12 to 14 teats, and it is therefore of little use for her to farrow more than this number. In addition, the piglets in such large litters are usually weak at birth. The most profitable size of litter to rear will depend on the number of teats and the milk yield of the sow. Few sows can rear more than 10 *thrifty* pigs. Gilts, because of their lower milk yield, should not rear more than 6 or 7 with the first litter. To have a herd average of 8 or more thrifty pigs weaned is considered very satisfactory.

Weaning Age.—With good feeding and management the young pigs should be weaned at about 8 weeks of age, when they should have an average weight of 35 to 40 lbs. and over. If they are not well developed at that time, weaning should be a little later.

Castration and Marking.—These operations should be performed at from 4 to 6 weeks of age and *not* a few days before or after weaning. For castration use clean, sterilised instruments, and put some disinfectant and fly repellent on the wound. At the same time the young pigs should be ear-marked (by means of a clipper) according to some definite system. The key below illustrates a satisfactory system.

One notch on the inside of the right ear equals 1.

Two notches on the inside of the right ear equals 2.

One notch on the outside of the right ear equals 3.

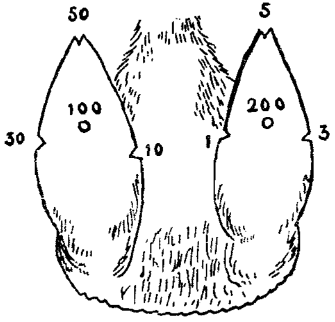


Fig. V. A system for ear-marking pigs.

One notch on the outside and one on the inside of the right ear equals 4.

One notch at the tip and one on the inside of the right ear equals 4.

One notch at the tip of the right ear equals 5.

One notch at the tip and one on the inside of the right ear equals 6.

One notch at the tip and one on the outside of the left ear, and one notch on the outside and one on the inside of the right ear equals 84, and so on.

With this system pigs can be marked from 1 up to 500 or over 600.

Pig Recording.—In progressive pig raising countries a system of pig recording rather similar in principle to the ordinary system of milk recording has come into use. Production and feed records are kept of all sows and their progeny, and carcase records are obtained when the baconers are slaughtered. By this means it is possible to determine which sows are the producers of large litters which use their feed economically and turn out into satisfactory baconers. By breeding from these sows only the productivity and profitableness of the herd is much increased.

All pig farmers should maintain some system of pig recording. The subject is too large a one to treat here, but particulars of systems suitable for different sets of circumstances can be obtained from the Department of Agriculture.

(To be continued.)

METHODS OF HARVESTING IN RELATION TO THE DRY-OUT OF MAIZE.

By R. D. Hampton.

Owing to the large amount of wet maize offered for export during recent years, the last Maize Grading and Export Conference requested the Department of Agriculture to institute enquiries and carry out experiments to ascertain the effect of different methods of harvesting on the rate of drying out of the grain.

This proposal was put into effect, and in addition to general advice on the matter published in the *Rhodesia Agricultural Journal*, a series of experiments were carried out last season on a field of maize at the Tobacco Experiment Station, Salisbury.

The soil in question consisted of a good type of sand of average fertility which had received 150 lbs. of bone and superphosphate and had been sown to maize underplanted with cowpeas for two years in succession.

The maize crop was planted on the 5th December, 1930, and half of the field was stooked on the 23rd April, 1931. The remaining half was left standing. The estimated yield was seven bags an acre.

In all, twenty-one trial reapings were carried ont, six dealing with stooks of 8 ft. diameter, five with stooks of 14 ft. diameter, five with stooks of a 36 ft. length by 6 ft. wide, and five with the standing crop.

In reaping from the stooks, the cobs selected for moisture test were in all cases chosen from the centre of the stook and every care was taken to obtain fair average composite samples from each reaping.

Unless otherwise stated, the grain was shelled immediately it was reaped; composite samples were then drawn at once and placed in air-tight containers and the moisture content was ascertained by the usual Brown-Duvel moisture test.

Details of the trials carried out are shown in the following table:—

TOBACCO EXPERIMENT STATION, SALISBURY: MAIZE MOISTURE EXPERIMENTS.

Sample No.	Method of Reaping.	Date Reaped.	Period between Reaping and Shelling.	Date Shelled.	Date Tested.	Moisture Content.
1.	ex stooks 8 feet diameter	11.6.31	Reaped and shelled at once	11.6.31	12.6.31	13.9 per cent.
5.	ex stooks 8 feet diameter	11.6.31	Remained on stover 7 days	18.6.31	19.6.31	13.0 per cent.
7.	ex stooks 8 feet diameter	11.6.31	*Remained on stover 7 days	18.6.31	19.6.31	12.7 per cent.
8.	ex stooks 8 feet diameter	—	Remained on stover 14 days	25.6.31	26.6.31	12.4 per cent.
18.	ex stooks 8 feet diameter	18.6.31	Reaped and shelled at once	18.6.31	19.6.31	13.6 per cent.
19.	*ex stooks 8 feet diameter*	25.6.31	Reaped and *shelled at* once	25.6.31	26.6.31	13.2 per cent.
2.	ex stooks 14 feet diameter	11.6.31	Reaped and shelled at once	11.6.31	12.6.31	14.7 per cent.
12.	ex stooks 14 feet diameter	11.6.31	Remained on stover 7 days	18.6.31	19.6.31	13.6 per cent.
13.	ex stooks 14 feet diameter	11.6.31	Remained on stover 14 days	25.6.31	26.6.31	12.9 per cent.
24.	ex stooks 14 feet diameter	18.6.31	Reaped and shelled at once	18.6.31	19.6.31	14.0 per cent.
25.	ex stooks 14 feet diameter	25.6.31	Reaped and shelled *at once*	25.6.31	25.6.31	14.0 per cent.
11.	ex stooks 36 x 6 feet	11.6.31	Reaped and shelled at once	11.6.31	12.6.31	14.6 per cent.
14.	ex stooks 36 x 6 feet	11.6.31	Remained on stover 7 days	18.6.31	19.6.31	13.8 per cent.
15.	ex stooks 36 x 6 feet	11.6.31	Remained on stover 14 days	25.6.31	26.6.31	12.4 per cent.
20.	ex stooks 36 x 6 feet	18.6.31	Reaped and shelled at once	18.6.31	19.6.31	14.2 per cent.
21.	ex stooks 36 x 6 feet	25.6.31	Reaped and shelled at once	25.6.31	26.6.31	13.4 per cent.
9.	ex standing crop	11.6.31	Reaped and shelled at once	11.6.31	12.6.31	13.1 per cent.
16.	ex *standing crop*	11.6.31	Remained *on stover* 7 days	18.6.31	19.6.31	12.4 per cent.
17.	ex standing crop	11.6.31	Remained on stover 14 days	25.6.31	26.6.31	11.8 per cent.
22.	ex standing crop	18.6.31	Reaped and shelled at once	18.6.31	19.6.31	12.9 per cent.
23.	ex standing crop	25.6.31	Reaped and shelled at once	25.6.31	26.6.31	12.4 per cent.

* The ears in this case were partially husked before being placed on the stover.

The results strikingly confirm the summary of advice published by the Department on this subject in the local press in March, 1931, and later in the *Rhodesia Agricultural Journal* for July, 1931.

If reasonable care is taken in the subsequent handling of the crop, stooking is not as conducive to excess moisture in the grain at shelling time as is often supposed. While it is true that in the case of the 8 ft. stooks, seven weeks after the date of stooking, the moisture content of the cobs taken from the inside of the stooks was .8 per cent. above that of the standing crop, yet by placing the ears upon stover for 14 days prior to shelling, the moisture content was reduced well below the maximum permitted for export.

It is also of interest to note that, by partially husking the ears, the rate of drying of the grain was considerably increased, so much so that ears treated in this way dried out .3 per cent. more in seven days than ears similarly placed on stover, but left entirely unhusked.

The tests made on 14 ft. stooks indicate that size is an important factor and that ears from stooks of this size contained .8 per cent. more moisture than those from 8 ft. stooks, and that fourteen days later the moisture content of the cobs in the larger stooks was 14 per cent., whereas in the smaller stooks it had fallen to 13.2 per cent.

The moisture content of the grain from stooks 36 x 6 ft. is somewhat higher than was expected, but these stooks did not appear to have been built quite wide enough at the base, and owing to their caving in at the centre, the air space was restricted and the ears were not afforded the maximum opportunity of drying out.

A point of particular interest in these results is the consistent rate of drying out of all ears placed on stover, and it appears that this is a safe and sure method of expediting a quick drying out of the grain.

Drying out of Standing Crop.—The rate of drying of the ears on the standing crop is also of importance. In fourteen days the cobs reaped from the standing crop and placed on stover, dried out from 13.1 to 11.8 per cent., while the moisture content of those remaining in the field unreaped, fell to 12.4 per cent.—.1 per cent. below the maximum

allowed in export maize. Many farmers do not realise how well standing maize may dry out in a short time, and often, if growers would but delay their reaping for another week or so, they would avoid much annoyance, delay and often serious loss through excessive moisture after shelling.

Two other tests were made on the rate of drying out of a standing crop of maize, namely at the Agricultural Experiment Station, Salisbury, and at the Government Farm, Gwebi. In the first case, starting on the 12th May, eight different samples were drawn from a field of maize each week. These samples were tested separately for moisture and the mean of the results was taken to be the average moisture content of the maize throughout the field on the date of sampling. On the Gwebi farm, only two samples were drawn each week.

The following results were obtained:—

Salisbury Experiment Station—

Date.	Moisture Content.
13.5.31	17.2 per cent.
21.5.31	15.1 per cent.
28.5.31	13.6 per cent.
4.6.31	13.5 per cent.
11.6.31	12.6 per cent.
18.6.31	12.5 per cent.
25.6.31	11.9 per cent.

Government Farm, Gwebi—

4.6.30	21.3 per cent.
21.6.30	18.8 per cent.
27.6.30	15.5 per cent.
4.7.30	15.1 per cent.
12.7.30	13.4 per cent.
19.7.30	12.6 per cent.
28.7.30	12.1 per cent.

In the case of the Salisbury Experiment Station, it will be noticed that very little drying out took place between the 11th June and the 18th June, the reason being that drying conditions during that week were very poor indeed, the number of hours of daily sunshine being very much below the average for the time of year.

The following report from a grower who has for several years been troubled with wet maize is striking testimony to the harvesting methods recommended.

Since our maize had been wet and turned down by the graders for the past three seasons, we decided this year to try the method of reaping advocated in the Journal. For the first time we have been able to deliver clean and dry maize to the station from July onwards and have experienced no trouble or delay in having it taken over for export.

Instead of riding mealies straight to a large dump after reaping from stooks, the cobs were laid in small heaps on piles of maize stalks and left there for not less than three weeks.

We found the damage by ants was negligible and one year's costings indicate that the extra cost entailed in so handling the maize can be set off against—

1. A full day's shelling contract from the first day, owing to the dryness of the ears.

2. No bother or loss of time in restacking wet maize, or stacking in a particular manner to enable air to circulate through the stack.

"Respice Finem."

THE "HIGH SPEED" SUCTION GAS PRODUCER.

By B. G. Gundry, A.I.Mech.E.

Through the courtesy of the inventor, Major J. A. Macdonald, D.S.O., M.C., of Kenya Colony, the writer has been afforded opportunities of conducting tests on the "High Speed" Suction Gas Producer, which has now been patented in forty countries throughout the world.

The results obtained were highly satisfactory, and there appears no reason why this plant should not meet the great demand which exists in this and other African colonies for cheap power for agricultural and transport purposes.

The design of this producer is very simple. As will be seen from the accompanying diagram, it consists primarily of the producer drum "A," a water tank "D," a cooling chamber "G" and a cleaner or scrubber "M." All these, with the exception of the water tank, are constructed of 16-gauge sheet iron with welded joints to render them completely air tight.

The operation of starting and running the plant is as follows: The engine is started up in the ordinary way on petrol, and, by means of a suitably arranged valve on the induction system, a certain proportion of the air necessary for its running is drawn through the producer system. The air valve "K" is closed, and the air therefore enters the system via the twyer "B," which consists of a short length of iron pipe passing through a flange bolted to the drum. A lighted torch, consisting of a piece of cotton waste or asbestos packing soaked in petrol, is held at the mouth of the twyer, and in a few seconds the charcoal, with which the drum has been previously filled, is well alight.

The water is now turned on by the fine adjustment valve "E" to flow at a fairly rapid drip. This water is drawn

into the fire, which is by now a small but intensely hot furnace (similar to a blacksmith's forge), and is immediately vaporised and decomposed to combine with the charcoal to form an inflammable gas.

This gas is drawn through the cooling chamber into the scrubber, which it enters by means of a pipe set tangentially to the periphery of the drum. This gives it a whirling motion round the cone "H," and the heavier particles of dust which it may contain are thrown down into a shallow oil sump. At the same time it is mixed with the requisite amount of air, which is admitted in the correct proportion by opening the valve "K."

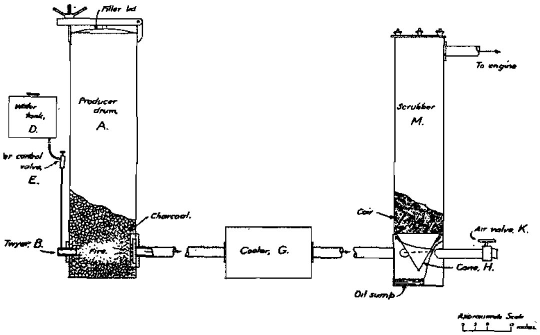


Diagram of the "High Speed" Suction Gas Producer.
(A producer of this size would be suitable for an engine of from 15 to 30 h.p.)

The mixture of gas and air is now drawn up into the body of the scrubber, where it passes through a filtering material such as sisal or cocoanut fibre steeped in oil. From here it passes direct to the engine. A sufficient quantity of gas is available to run the engine in less than five minutes from the time the charcoal is lighted, and the petrol may then be completely turned off, and the producer requires no further attention until the supply of charcoal or water is exhausted. The producer can be refilled with charcoal in a few seconds, and the engine can be restarted on gas without the use of petrol.

It might well be imagined that the fire in the producer would rapidly spread throughout all the charcoal in the drum, but this is not the case, as it remains confined to the small area between the twyer and the outlet pipe. The drum remains so cool a few inches above the level of the twyer that it can be touched with the hand without discomfort.

Charcoal from various woods has been used in this producer, including msasa, mdondo, gum (rostrata and salignum), and commercial charcoal of unknown origin. From general observations it appears that there is little difference in the gas-producing qualities of these woods, although accurate comparative tests have not yet been made. It may be safely assumed, however, that the amount of gas produced from any charcoal will be more or less proportional to its specific weight. Charred mealie cobs, although rather light, appear to give excellent results.

It is important to ensure that the charcoal used is free from sand and dirt, as such becomes fused into a solid mass in the furnace and lowers the efficiency of the producer.

It may be found that certain Rhodesian timbers are definitely unsuitable on account of the high percentage of silica they contain, but it is believed that in most cases such silica is concentrated largely in the bark, whether by the natural process of growth or whether, as the writer is inclined to believe, it is deposited externally in the form of dust by the wind, is not known, but in either case the trouble may be overcome by the simple process of stripping the bark from the timber before it is converted into charcoal.

It must be realised that an engine designed specially to run on pertol or paraffin cannot under ordinary conditions give the same output of power when run on gas. In order to obtain the best results possible it is necessary to increase the compression ratio of the engine to about 7 : 1, and to re-adjust the ignition timing to permit of a considerably greater degree of advancement than is required when running on petrol.

In some engines, particularly those on tractors, the induction system is designed so that the in-going charge is considerably pre-heated; this is an undesirable feature when it is desired to run the engine on gas, as it is essential

that the engine should receive the greatest weight of gas possible at each charge. For the same reason it is sometimes advisable to enlarge or simplify unduly restricted or tortuous inductive pipes. Such alterations are difficult to make on some engines and relatively simple on others.

The High Speed Gas Company, which has been formed in Salisbury to handle the producer in Rhodesia, is now engaged in investigating and experimenting with various makes of tractors and lorries with a view to determining the cheapest and most convenient method of adapting the producer, and it is hoped that before long certain necessary fittings will be standardised so that the process of converting the more popular types of vehicles will be reduced to a matter of routine.

It must be remembered that the loss of power in internal combustion engines, due to altitude alone, which may be taken roughly as four per cent. for every thousand feet above sea level, would in most parts of Southern Rhodesia amount to from sixteen to twenty per cent.

In the case of agricultural tractors any loss of engine power decreases the efficiency of the tractor to a far greater extent than such a loss would indicate at first sight. Since approximately fifty per cent. of the engine power is required to move the tractor under, say, ordinary ploughing conditions, it follows that if the power of the engine is reduced for any reason by twenty-five per cent., its pulling power is reduced by fifty per cent., as fifty per cent. of its original power is still required to move the tractor itself.

In many cases it would be necessary to reduce the load on the tractor by reducing the number of plough discs or shares, which would increase the actual ploughing time, but if it is necessary to perform the same amount of work in the same time as with paraffin, then the only alternative is to use a somewhat larger tractor.

It may not be generally known that fruitless enquiries have been made of several English manufacturers on behalf of this Government, for tractors specially designed for use with suction gas, as it was realised that when an efficient producer was available it could not be used to the best advantage until such a tractor was also available.

Major Macdonald is now in France, where he is demonstrating his plant at the request of the French Government, and it is possible that before long a really suitable type of tractor may be obtainable.

After exhaustive trials and satisfactory tests the local manufacturers, Messrs. the "High Speed" Gas (Rhodesia), Ltd., are now turning out plants to suit tractors, lorries and stationary engines.

RESULT OF PLOUGHING TEST MADE WITH A "JOHN DEERE" 15-27 H.P. TRACTOR,

fitted with "High Speed" Suction Gas Producer.

The compression ratio of the engine was increased to approximately 7 : 1 by attaching aluminium plates to the pistons, and the induction system was modified to avoid pre-heating and to permit of the change over from petrol to gas being easily made. A John Deere four-furrow disc plough with one disc removed was used for the test.

The test was made on commonage land to the east of the Salisbury-Borrowdale road. The ground, a heavy loam, had been worked the previous season, but at the time of the test was dry and hard.

Two stoppages were made—one of five minutes' duration caused by the needle valve of the water supply becoming choked owing to the tank not being fitted with a proper strainer, and one of three minutes owing to the tractor stalling in a patch of extra heavy ground.

The charcoal used was made from gum from which the bark was stripped before burning, and, as broken for use, weighed 20 lbs. per cubic foot.

The draw-bar horse power was measured over a distance of 500 feet. The depth of ploughing was measured from the surface of the unploughed ground to the bottom of the furrow, and the depth given, six inches, is the average of a large number of measurements taken at random.

SUMMARY OF RESULTS.

Date: 23rd October, 1931.

Make of tractor: John Deere 15-27 h.p.

Make of plough: John Deere four-furrow disc with one disc removed.

Total area ploughed: 1.08 acres.

Nett ploughing time, exclusive of stoppages: 1 hour 48 minutes.

Area ploughed per hour: .6 acre.

Quantity of charcoal consumed per acre: 54 lbs.

Average h.p. at draw-bar: 11.03 h.p.

Average depth of ploughing: 6 inches.

RESULTS OF TWO TEST RUNS MADE ON A BROCKWAY MOTOR LORRY,

fitted with a "High Speed" Suction Gas Producer.

The Brockway lorry with which these tests were made is rated by the makers to carry a maximum load of 2,500 lbs. It is fitted with a platform body and has travelled, according to the mileage indicator, rather over 10,000 miles.

The compression ratio of the engine was increased to approximately 6.5 to 1 by attaching aluminium plates to the piston heads, and the distributor re-set to permit of the ignition being advanced considerably more than is possible on the normal setting for petrol.

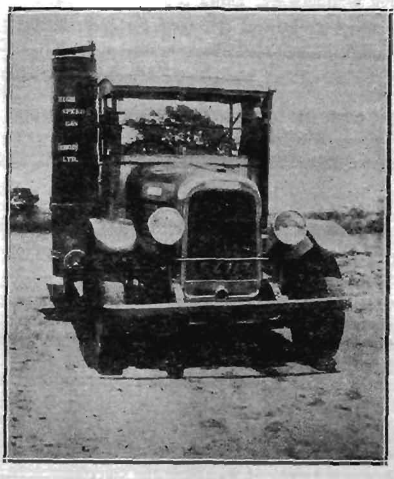
The load carried on the first run consisted of three drums of tar and three passengers, and, on the second run, four drums of tar and two passengers. The weight of the driver and producer is not included in the "useful" load specified.

The route traversed was from the Government Irrigation Office to a point approximately ten miles out on the Salisbury-Marandellas road and back.

The average speed on the first run with an 83 per cent. load was 15.34 m.p.h., and on the second run with a 97.5 per cent. load, 15.93 m.p.h.; and it must be noted that the maximum speed was deliberately restricted as far as possible to 25 m.p.h., and this speed was only exceeded for one or two brief periods.

The charcoal used was made from freshly-cut msasa wood from which the bark had been stripped before burning. The consumption was ascertained by measuring the volume occupied by the charcoal in the producer before and after the run.

The amount of water consumed by this producer is known to be so small (approximately one gallon to 80 miles) that it was not measured.



Lorry adapted to use "High Speed" Suction Gas.

GENERAL OBSERVATIONS.

No involuntary stoppages were made on either run, nor was any trouble in the running experienced. Apart from an occasional readjustment of the needle valve on the water supply, which is conveniently situated within easy reach of *the driver, neither the gas producer nor engine received any*

attention whatever. The engine ran very sweetly throughout and remained extraordinarily cool.

It was noted that this lorry did not perform particularly well on second gear, but on low gear there appeared to be ample power available to negotiate any main road hill.

CONCLUSION.

As the primary object of these runs was to check the consumption of charcoal, it is of interest to draw a rough comparison between the relative cost of running on gas and petrol.

Assuming the price of clean, carefully prepared charcoal in Salisbury to be 2s. 6d. per bag of three cubic feet, excluding the cost of the bag itself, and that the normal petrol consumption (as stated by the owner of the lorry) to be 12 miles per gallon, the costs of the two fuels for a run of 20 miles with a full load would 1s. 4½d. for charcoal as against 4s. 7d. for petrol at 2s. 9d. per gallon.

SUMMARY OF RESULTS.

Date	19.11.31	20.11.31
Useful load carried	2,075 lbs.	2,439 lbs.
Percentage of rated load ...	83%	97.5%
Distance run	20.2 miles	19.9 miles
Total time of run	79 minutes	75 minutes
Average speed	15.34 m.p.h.	15.93 m.p.h.
Total volume of charcoal consumed	1.55 cu. ft.	1.64 cu. ft.
*Total weight of charcoal consumed	24.33 lbs.	25.74 lbs.
Weight of charcoal consumed per mile	1.2 lbs.	1.3 lbs.
Weight of charcoal consumed per ton mile	1.3 lbs.	1.19 lbs.

* The weight of a sample of the charcoal as used was determined as 15.7 lbs. per cubic foot.

An application of this producer which must not be overlooked is that for stationary plants for grinding or shelling mealies, electric lighting, etc. For such purposes the producer is eminently suitable, as there is no restriction to the size of the engine which may be selected for any particular job.

The engines of old motor cars, which through an *accident* or rough use were no longer serviceable, have been successfully set up and run as stationary power plants.

GWEBI PRODUCE PRICES.

Hull-less oats	40/- per bag of 150 lbs.
Large Black sunflower seed ...	14/- per bag of 100 lbs.
Dolichos beans	35/- per bag of 200 lbs.
Linseed	60/- per bag of 200 lbs.
Linseed (quantities under 100 lbs.)	4½d. per lb.
Sweet potato tubers (Calabash Leaf)	6/- per bag of 150 lbs.
Napier fodder roots	6/- per bag of 40 lbs.
Sweet potato cuttings (Calabash Leaf)	6/- per bag of 40 lbs.
Edible canna corms	10/- per bag of 150 lbs.
Pumpkin seed	1/1 per lb.

All prices quoted are for *delivery free at any station or siding* in Southern Rhodesia. Before sending cheques, intending purchasers are advised to ascertain that the seeds, etc., required are still available. Cheques should be made payable to "Gwebi Farm." All orders and enquiries should be addressed to the Chief Agriculturist, Department of Agriculture, Salisbury, *not direct to the Gwebi Farm.*

SYMBIOSIS IN RELATION TO AGRICULTURE.

Symbiosis may be defined as an internal partnership between two different kinds of organisms, where the partnership is distinctly beneficial to both.

Several other kinds of partnership between organisms are known to exist, and different terms are employed to indicate the relationship; thus *commensalism* indicates a partnership very similar to symbiosis, but an external one. Perhaps the best known illustration of commensalism is the mutually beneficial arrangement between hermit crabs and sea-anemones: endo-parasitism is an external arrangement which is beneficial to the parasite only and is injurious to the host.

Symbiosis exists between organisms of many different kinds.

The first case which was definitely proved was that of lichens, and it has since been shown to be of very common occurrence throughout a large portion of the animal and plant kingdoms. Thus symbiosis is known to occur between plants of different kinds and between plants and animals.

Inoculation of Pine-plantation Soils.—In many parts of this country pines will not flourish unless the soil is first inoculated with a special fungus which is necessary for their development. Fortunately the process of inoculation is a very simple matter, as it is only necessary to mix a very little of the soil containing the fungus with the seed-bed soil—or with that used in the pricking-out tins. If pine trees have already been planted out in suitable soil and climatic conditions and are not getting away—that is, if they are pale in colour and refuse to grow—it is highly probable that the fungus is missing, and a little infected soil should be scattered over the surface or forked in around the trees. The relationship between the fungus and the plant is a complicated root association which is a further illustration of symbiosis known as a mycorhiza.

The name "mycorhiza" was coined by the German botanist Frank in 1885 to indicate his belief that the root, together with its associated fungus mycelium, constituted an independent organ of great importance. He reported an invariable and intimate association between fungi and the roots of forest trees, especially oak, beech, hornbeam, conifers, etc., the arrangement being, in his opinion, not parasitic, but definitely beneficial to both.

Inoculation of Legumes.—The effect of a leguminous crop on other crops which follow in the rotation appears to be invariably beneficial. Investigations have shown that a marked residual effect may occur even though the legume crop is harvested and the tops removed. Until quite recently it has been thought that this effect is due to the legume plant being able to fix nitrogen with the aid of bacteria which live in the nodules on the roots. Because of this fact it was understood that a legume crop left the soil heavily infected with nitrogen-fixing bacteria. Recent investigations seem to indicate, however, that the residual effect is possibly due to the addition of organic matter to the soil through the heavy root growths which often penetrate to a great depth. This is of particular interest, because it would probably throw some light on the beneficial effect of cotton on succeeding crops, although this effect could certainly not be attributed to the usual bacterial action, since cotton is not a legume.

Legumes play such an important part in agriculture that a great deal of attention has been devoted to the nitrogen-fixing activities exhibited by them, and a good deal of interesting information has been obtained. It has been ascertained that the relationship between the bacteria in the nodules on the roots and the plants themselves is not one of chance parasitism, but of symbiosis. The bacteria concerned with nitrogen-fixation may be considered in two groups, those which live free in the soil and those which form tubercles on the roots.

Bacillus radicicola, or some biological strain of this species, is the organism which causes the tubercles on the roots of the legumes. This symbiotic association between the bacillus and the plant is of the greatest importance, as the bacteria are able—in some manner not yet clearly ex-

plained—to assimilate free nitrogen from the air and fix it for the use of the host plant. In exchange for sugar and other foods, which the bacteria obtain from the legume root tissues, it is assumed that they have the power of combining the nitrogen obtained from the air into compounds necessary for the elaboration of proteins and that in the form of waste products these become available for the host plant. If the soil is sufficiently rich in nitrogen, or if the soil conditions are unsuitable for the active multiplication of nitrogen-fixing bacteria, or if a suitable strain of nodule organisms is not present in the soil, no nodules are produced on the plant. Under such circumstances the whole nitrogen requirements are taken direct from the soil, and if sufficient supplies are not available, the plants suffer. The inoculation of legume seeds with a suitable strain of organisms is, therefore, always desirable, and this practice is being more and more generally adopted.

Recent investigations show that the various strains of organisms known under the name of *Bacillus radicicola* fall into distinct groups, each of which is capable of producing nodules on a limited number of host plants. The organisms belonging to any one group cannot, as a rule, produce nodules on plants belonging to any other group, although a few such cases have been claimed. Thus soya beans and lupines each form separate groups in which they appear to stand alone, and the strain concerned is not the same as is required by the broad bean, which occupies a group with the sweet pea, lentil and narrow leaved vetch. Crimson, alsike and wild white clover fall into another group, and this is distinct from that containing white sweet clover, bur clover, yellow trefoil and lucerne. The peas fall chiefly into two distinct groups. In one the common garden pea, the field pea and the hairy vetch all occur; in the other we have the cow-pea, partridge pea, velvet bean and lima bean. It is interesting to note that the organisms associated with many species of acacia belong to the same strain as that concerned in the inoculation of the cow-pea and the lima bean group.

C.K.B.

SOUTHERN RHODESIA MILK RECORDING SCHEME.

The Minister of Agriculture has approved of the adoption of the following regulations for the official and semi-official milk recording and testing of dairy herds in Southern Rhodesia.

These regulations came into force on 1st January, 1932.

GENERAL CONDITIONS.

(1) Whenever possible, the Official Milk Recorder will be present at the milking previous to the first milking taken for the check test in order to see that the cows are all milked dry.

(2) No test for butter fat will be taken by the Recorder until eight days have elapsed since the cow calved, or until such time as her milk, when boiled, does not coagulate.

(3) All records shall commence not earlier than the fifth day after calving, the day on which the cow calved being counted as the first day.

(4) There shall be not less than two or more than three milkings in the twenty-four hours, provided that the Dairy Officer may grant permission for a cow yielding over eight gallons per diem to be milked four times daily. The *number of milkings per diem shall be stated on the certificate* or statement of performance when issued.

(5) The Government shall have the right to make use of the data obtained in respect of the testing and recording of grade and pure-bred herds for propaganda or other purposes, provided that the names of the owners or breeders and the names of their animals shall not be published without the consent in writing of the farmers or breeders concerned.

(6) All farmers or breeders whose herds are recorded and tested must furnish brief particulars of the feeding of the cows under test; such information to be entered by the owner or his representative each month on the weights sheet.

The quantity of concentrates or roughage fed daily and the condition of the veld, if running on same, must at least be stated.

(7) Notwithstanding what is laid down in regulation 5, the completed records of all cows in respect of which a certificate or statement of performance has been issued, together with the names of the owners and, whenever possible, brief particulars of feeding, will be published from time to time in the *Rhodesia Agricultural Journal* or in such other publication as the Department may approve of, provided that no records will be published in any publication other than an Agricultural Journal without the consent in writing of the owners or breeders concerned. Similarly herd averages may be worked out annually and published in the same Journal.

(8) All testing fees shall be paid to the Milk Recorder upon the occasion of each visit; fees for surprise tests, however, as provided under regulation 24 (g), may be paid to the Milk Recorder on his subsequent visit to the farmer or dairyman concerned.

The Department shall have the right to refuse further service and to cancel the Milk Recorder's visits to any farmer or breeder who fails to comply with this requirement.

(9) All breeders, farmers and dairymen whose herds are officially or semi-officially recorded and tested will be required to provide the Milk Recorder with suitable board and lodging, free of charge, during the whole of the period it is necessary for him to remain on their property. When considered necessary, they may also be required to convey the Recorder, free of charge, from the railway station to the farm, and likewise convey him back to the railway station or to the next farm he has to visit, as the case may be.

(10) The Dairy Officer shall have the right to refuse to issue a certificate or statement of performance in respect of any cow in regard to the accuracy of whose record he is not satisfied.

(11) (a) The feeding of whole milk, cream or eggs to cows under test is prohibited, as is also the dosing of them with stimulants, medicines or concoctions calculated in the opinion of the Dairy

Officer to temporarily and abnormally affect their production, and certificates will not be issued or records published in respect of cows so fed or treated.

(b) Owners may be required to furnish to the Dairy Officer a declaration as to the foods and quantities of each comprising the rations fed to their cows during the period they are under test, and, if deemed necessary, must permit samples of the different foods to be taken for analysis.

(12) Notwithstanding anything to the contrary which may appear to be indicated in these regulations, no person shall have the right to demand the services described in this scheme, if for any reason whatsoever the Department is not in a position to provide such services.

(13) In the event of any difference of opinion in regard to the interpretation of any of these regulations, or in the event of any question arising for which no provision is made in these regulations, the Dairy Officer shall be the sole arbiter in such cases, and his decision in the matter shall be final.

(14) Copies of these regulations can be obtained from the Dairy Officer, Department of Agriculture, Salisbury.

OFFICIAL MILK RECORDS.

Only pure bred registered cows, which shall include all animals registered in the South African Stud Book or other recognised South African or Overseas Herd Book, shall be officially recorded and tested.

(15) All pure bred registered cows entered for the official test shall be submitted, once in every thirty days, to a forty-eight hours' check test by the Department's Official Milk Recorder; during this period the milk of each cow shall be weighed and tested for butter fat at each and every milking.

(16) The official testing and recording of a herd of less than 10 cows will only be undertaken if circumstances permit.

(17) The following scale of fees will be charged to breeders or farmers who agree to enter their whole herd for the official test and who undertake to comply with the conditions laid down in regulation 18.

(a) The minimum charge for a visit by the Department's Official Milk Recorder shall be £1.

(b) For this fee the breeder or farmer will be entitled to have up to 10 cows officially tested at the same time and on the same premises.

(c) For every cow above 10, the fee for official testing will be 1s. per cow per visit.

(d) Breeders who have entered their pure bred herd for official test and who desire also to have unregistered or grade cows tested at the same time and on the same premises will be charged at the rate of 3d. per grade cow per visit. Only a 24 hours' check test will, however, be taken of such unregistered or grade cows.

(18) All breeders wishing to avail themselves of the scale of charges provided in the foregoing regulation shall, when applying to have their herds tested, undertake to comply with the following conditions, viz.:—

(a) Every cow in the herd must be officially tested and recorded as she calves down and every time each calves so long as the herd is under official test; provided that exemption may be obtained from the Dairy Officer in respect of cows suffering from sickness or accident or for other special reasons which, in the opinion of such officer, constitute sound and valid grounds for granting exemption; no such exemption, however, shall be granted on account of adverse climatic conditions except in very exceptional and abnormal circumstances.

(b) No cow shall be withdrawn from the official test before she has completed 300 days from the commencement of her record or has ceased to yield milk before the expiration of that period except in cases of sickness or accident, when permission to withdraw may be granted by the visiting Official Milk Recorder, who shall then report the circumstances to the Dairy Officer, who may, if in his opinion there is no justification for withdrawal, require the cow to complete her test.

(c) The keeping of daily weights will be optional, and owners preferring not to keep such will be allowed to record the weight of milk yielded by each cow at each milking on two days each week; the days on which the weights are to be taken must be stated by the owner when making application to have his herd tested, and shall be rigidly adhered to unless permission to alter them is obtained from the Dairy Officer. In cases where daily weights are not taken, the total weight of milk for the month (30 days' period) shall be calculated by multiplying the average daily weight of milk yielded on the days the milk has been weighed by 30; the weights of milk recorded by the Official Milk Recorder during his forty-eight hours' test also being reckoned for this purpose.

(d) *Official certificates of performance* shall be issued in respect of cows which complete a minimum of 240 days under test or which qualify within that period in respect of butter fat requirements for the Advanced Register, Register of Merit, Shorthorn Dairy Record Standard, or any other standard accepted by any recognised Breed Society, and, at the discretion of the Dairy Officer, in respect of such cows which may have died during test or been withdrawn owing to sickness or accident before the expiration of that period. All such certificates shall be endorsed stating whether the record has been based on daily or twice-weekly weighings. No certificate, however, shall be issued for a cow until she has recalved after completing her test or has failed to recalve at the expiration of eighteen months from the commencement of her test, whichever is the earlier date. Date of recalving shall be entered on the certificate, or, in the event of failure to recalve within eighteen months, a note shall be made to that effect. Owners not requiring certificates for any particular animals must notify the Dairy Officer to that effect as soon as the cow concerned has completed her test; otherwise certificates will be issued for each animal recorded.

Official certificates issued in respect of pure-bred registered cows shall be forwarded to the Breed Society or Association concerned, from whence they will be returned to the breeder or owner.

(19) Breeders who are unwilling to submit their whole herd for the test, but who wish to have only a few selected animals tested, shall be allowed to have such officially tested under the following scale of charges:—

(a) The minimum charge for a visit by the Department's Official Milk Recorder shall be £2.

(b) For this fee the breeder will be entitled to have up to five cows tested at the same time and on the same premises.

(c) For every cow above five the fee for official testing will be 2s. per cow per visit.

(20) Breeders who enter cows under this regulation must record the weight of milk yielded by each cow under test at every milking, and the conditions relative to the issue of certificates laid down in regulation 18 (d) of this notice shall also apply to them.

(21) If at any time more applications for official recording and testing of pure-bred cows are received than can at the time be undertaken by the Department, preference shall then be given to applications for the testing of whole herds under regulations 17 and 18 of this notice.

(22) (a) Applications for the official testing and recording of pure-bred registered cows under this scheme must be made on the form issued for the purpose and obtainable from the Dairy Officer, Department of Agriculture, Salisbury, to whom the form after completion must be forwarded.

(b) All entries of cows for the official test must be made before calving, and entries cannot be accepted in the case of herds in which cows are not already being tested unless completed application forms are sent in not later than twenty-one days prior to the date on which the first cow to be tested is expected to calve.

(c) All owners entering cows for the official test will be supplied free of charge with the necessary

official weighing books in which to enter the weight of milk yielded by each cow.

(23) All official records shall be for a lactation period of 300 days; owners may, however, continue cows in test up to 365 days, and a statement of the performance during this extended period will be included in the certificate when issued.

SEMI-OFFICIAL MILK RECORDS.

(24) Owners of pure-bred registered cows who do not desire to enter their herds for the official test, and farmers and dairymen who wish to record and test their herds of grade cattle, may place their herds under semi-official test, as provided hereunder:—

(a) In the case of herds which are placed under semi-official test the minimum charge for a visit by the Department's Official Recorder will be 7s. 6d.; for this fee the farmer will be entitled to have up to 10 cows tested at the same time and on the same premises; for every cow over this number the fee for testing will be 3d. per cow per visit.

(b) Only cows whose calves are hand-reared shall be recorded and tested.

(c) Every cow in the herd must be recorded and tested every lactation, so long as the herd is under test; if the owner refuses to agree to this stipulation, the Department shall refuse to record and test his herd. Cows suffering from sickness or accident, and such as are over 10 years old or for any other valid reason, may be exempted at the discretion of the Milk Recorder.

(d) Each cow shall be submitted once in every 60 days to a 24 hours' check test by the Department's Milk Recorder; during this test period the milk of each cow shall be weighed at each and every milking, and a composite sample of the morning's and evening's milk of each cow shall be taken and be tested for butter fat.

(e) The keeping of daily weights shall be optional, and owners preferring not to keep such may record the weights of milk on one fixed day in each

week and have the two months' yield worked out from the average of such weights and those obtained by the Recorder during his 24 hours' check test. Weighing sheets will be provided free of charge. All weighing sheets must be kept up to date and will be collected every 60 days by the Milk Recorder.

(f) The semi-official testing and recording of a herd of less than ten cows will only be undertaken if circumstances permit.

(g) In addition to the bi-monthly visits from the Milk Recorder as provided under (d), surprise visits may also, and at any time, be paid by the Milk Recorder to farmers or dairymen whose herds are recorded under this scheme; during these surprise visits each cow under test shall be submitted to a 24 hours' surprise check test. The expense of one such surprise test, if made, shall be borne by the farmer or dairyman concerned, and the fees charged therefor shall be as provided under (a).

(25) No cow, unless she has ceased to yield milk, shall be withdrawn from the test unless permission for withdrawal has been obtained from the Milk Recorder.

(26) Statements of performance will be issued in respect of each cow which produces a minimum of 150 lbs. of butter fat during a lactation period of not more than 300 days.

(27) Application for the semi-official testing and recording of dairy herds shall be made on the form supplied for the purpose and obtainable from the Dairy Officer, Department of Agriculture, Salisbury, to whom the form, after completion, should be forwarded. Entry forms, which can be obtained from the Dairy Officer, must be filled in by the farmer or dairyman concerned for each cow entered for the semi-official test; these forms must be handed to the Milk Recorder. To enable the Milk Recorder to identify each cow tested, the owner must brand or mark each animal in manner approved by the Milk Recorder, and must renew such brand or mark from time to time as may be necessary, except in the case of broken colour animals, which can be identified

by means of the colour diagrams on the back of the entry form.

(28) The testing and recording of any grade herd under this scheme may be discontinued at any time, if, in the *opinion* of the Dairy Officer, the owner of such herd is not deriving full advantage or benefit from this service.

SALES.

AGRICULTURAL EXPERIMENT STATION, SALISBURY.

Spineless Cactus Slabs (Blades), Algerian Variety: 20 slabs, 5s.; 50 slabs, 10s.; 100 slabs, 17s. 6d.

Stocks are limited, and delivery cannot be undertaken until January next.

Kudzu Vine Crowns: 10 crowns, 5s.; 20 crowns, 7s. 6d.; 50 crowns, 15s.; 100 crowns, 25s.

Delivery during January for dry land. Owing to pressure of other operations, it is not possible to deliver Kudzu crowns during December. The prices are for delivery free at purchaser's nearest station or siding in Southern Rhodesia. Cheques should be made payable to the Department of Agriculture, and preliminary enquiries and subsequent orders should be addressed to the Chief, Division of Plant Industry, Department of Agriculture, Salisbury.

HOW TO MAKE USE OF THE FENCING LAW.

As the provisions of the "Fencing Ordinance, 1904," have been applied to the whole of the Colony, it is competent for any landowner to require his neighbours to join in or contribute to the construction of fences on mutual boundaries, in such proportion as may be agreed upon between them. To this end he should serve a notice in writing on the person he desires to contribute, specifying the boundary to be fenced, the kind of fences and mode of erection proposed. (*See specimen letter A.*)

If within three months no agreement is arrived at in respect of any of the above points, the matter is to be settled by arbitration. (*See specimen letter B.*)

If either of the parties fails to carry out any of the work of construction that he has agreed to do, or has been allotted by an arbitrator, the other party may carry it out and recover the share of the cost that the first party should have contributed, in any Court of competent jurisdiction.

The person called upon to contribute to the construction of a dividing fence may, by giving notice within one month of the amount being fixed for which he is liable, pay such amount by equal annual instalments, with interest at 6 per cent. per annum added. (*See specimen letter C2.*) If the capital amount does not exceed £100, the payments may be extended over five years, and if the amount exceeds £100, the payment may he extended over ten years. In a schedule to the Ordinance there is given a table for calculating the amounts payable every year for five or ten-year periods.

When an owner is absent or cannot be found, or any land is unoccupied, the owner of any adjoining land who wishes him to contribute to the cost of a fence must advertise at least once a month for three months in the *Gazette* and a paper circulating in the district, requiring him to contribute. (*See specimen notice D.*) He may then obtain an order from

the Magistrate authorising him to proceed with the construction, and in due course a certificate of the amount due by the owner of the adjoining land. This certificate must be lodged with the Registrar of Deeds, who will make an entry in respect of the land affected, which entry will constitute a hypothecation of the land.

Tenants, excepting those whose unexpired term of lease does not exceed one year, are liable to pay interest at the rate of 6 per cent. per annum on half the cost of construction, and tenants who have the right of purchase are liable to have any sum paid by the owner for construction of fence added to the purchase price.

Owners of land on either side of dividing fences are liable for the cost of repairs in equal proportion. An owner can serve on his neighbour a notice requiring him to assist in repairing such fence (*see specimen letter E*), and if the second owner refuses or neglects to do so, after one week the first owner can make the repairs and recover his share from the second. Fences destroyed by accident may be repaired without notice. If the fence is damaged through the neglect of either of the parties, he only is liable for the whole cost of repairs.

The Ordinance does not affect any substantial fence already erected at the time of the coming into operation of the Ordinance.

If the owner of any land shall have erected by 10th December, 1926, a fence on the boundary of his land, and any other person shall adopt any means by which such fence shall be rendered of beneficial use to himself, he shall be liable to pay the owner of the fence interest at 6 per cent. per annum on half the then value of so much of the fence as he makes use of, and shall also be liable for half the cost of repairs.

Any person erecting a fence on land covered with bush is entitled to clear the bush for a width not exceeding six feet on either side of such fence, and to remove any tree standing in the direct line of such fence. The cost of clearing may be added to the cost of the fence in cases where any part of the cost of the fence is to be recovered from another party.

Where a river forms the boundary of contiguous lands, but is not capable of resisting the trespass of animals liable to be impounded, it shall be competent for the owners to agree upon such a line of fence on either side of the river as shall secure such fence from the action of floods; and in the event of their not agreeing upon such a line of fence, and whether any or what compensation in the shape of an annual payment shall be paid to either party for loss of occupation of land, the question shall be settled by arbitration.

If the owner of any land shall clear the same of inflammable materials for the space of fifteen feet from any boundary fence, and the owner of the contiguous land shall neglect so to clear his land, such owner shall be liable for any damage done to the fence by fire due to such neglect, and is required to make good the damage within one month, failing which the neighbouring owner may make good the damage at the expense of the owner in default.

Every person engaged in constructing or repairing a fence under this Ordinance may enter upon the contiguous lands, if necessary, at any reasonable times and do any reasonable acts thereupon that may be required for the construction or repair of the fence, but he may not enter upon any cultivated ground, garden, plantation or pleasure ground or cut down or lop any fruit or ornamental trees or shrub without the consent of the owner.

Any owner to whom any amount may be due by any person by way of contribution towards the construction of a dividing fence may call upon such person to pass a mortgage bond upon his land. (*See specimen letter F.*) If the said person shall refuse or fail to pass such mortgage bond the owner may notify to the Registrar of Deeds the fact that the amount is owing and no mortgage has been passed. (*See specimen letter G.*) The Registrar of Deeds shall then notify the person named, the fact and particulars of the notification received from the first party, and if no objection is lodged within three weeks the amount of the debt is registered in the Deeds Office and no transfer or mortgage on the property can be passed until the bond above referred to has been duly passed. Should any objection be raised, no entry shall be made in the Deeds Office registers except with the consent of the said person or upon the order of a competent Court.

An "owner" is described in the Ordinance and amending Act as—

(a) Any person, company, co-partnership or public body in actual occupation of or entitled as owner to occupy any land alienated from the British South Africa Company, or entitled by virtue of any certificate or document conferring a right to claim any land from the British South Africa Company.

(b) The Council or other governing body of any Municipality or Corporate Town, in respect of all lands to which or to the use of which the inhabitants of such Municipality or Corporate Town have acquired or may hereafter acquire a common right.

(c) Any person lawfully occupying or holding land in accordance with the provisions of any agreement, made before or after the taking effect of this Act, empowering the Government to allot lands upon the promise of title, subject to the fulfilment by the allottee of prescribed conditions.

It should be noted that the Government is not amenable to the fencing laws in respect of boundary fences between Crown land and privately owned land and between native reserves and privately owned land, nor is it legally bound to contribute towards the cost of erecting fencing along declared roads passing through privately owned land.

The Government has, however, accepted a limited amount of financial responsibility for the cost of erecting the three above-mentioned types of boundary fences. In other words, sums of money are voted annually in the Votes of the Department of Lands, the Native Department and the Department of Mines and Works, from which claims in respect of boundary and road fences can be met, but only up to the amount voted annually for this purpose.

Applicants desiring Government assistance towards the cost of fencing boundaries between Crown lands and their farms should therefore apply to the Department of Lands, and those desiring to fence between their farms and native reserves, to the Chief Native Commissioner. The Department of Mines and Works should be approached for a contribution towards the cost of fencing along declared roads.

SPECIMEN LETTERS.

A.—Letter calling upon a neighbour to join in the cost of a fence.

Dear Sir,—

I beg to inform you that I propose to erect a dividing fence on the border of this farm and that of........................ and call upon you, in terms of section 6 of the "Fencing Ordinance, 1904," to contribute towards the cost thereof. The line concerned runs from.................to....................

I propose the erection of..............(*here state kind of fence to be erected, material, cost, etc.*) and that............... (*here state proposals for erection, by what means, cost, etc.*)

Yours faithfully,

B.—Letter calling upon a neighbour to go to arbitration.

Dear Sir,—

With reference to my letter of....................(see *A*) in view of our failure to arrive at an agreement with regard to ....(*here state points on which no agreement arrived at*), I now propose that the matter should be settled by arbitration in terms of clause 7 of the "Fencing Ordinance, 1904," and have nominated Mr........................to act as arbitrator on my behalf. Will you please nominate an arbitrator to act for you?

Yours faithfully,

C1.—Letter acknowledging A and agreeing to share expenses.

Dear Sir,—

I have your letter of.................regarding the erection of a joint fence, and in reply beg to state that I am prepared to agree to the terms suggested and to pay half cost of all expenses (*or any other proposals as the case may require*).

Yours faithfully,

C2.—Letter acknowledging A and requesting to pay by instalments.

Dear Sir,—

I have your letter of.................regarding the erection of a joint fence. In reply, I beg to state that I am pre-

pared to agree to the fence suggested, but wish to avail myself of the provisions of section 9 of the "Fencing Ordinance, 1904," and to pay the amount of my share of the cost by instalments, with interest at the rate of 6 per cent. per annum, extending over a period of.................years.

Yours faithfully,

(See in reply specimen *F.*)

D.—Notice in Gazette *and Newspaper calling on owner whose address is unknown to contribute.*

To A.B., owner of farm............................situated in the District of.......................

Take notice that I intend to fence my farm................. and in terms of sections 5 and 11 of the "Fencing Ordinance, 1904," I hereby call upon you to contribute towards the cost of construction of the fencing of our common boundaries from......................to.......................

(Sgd.) C.D.

E.—Letter calling on neighbour to assist in repairing a boundary fence.

Dear Sir,—

I beg to inform you that the boundary fence dividing our farms....................and.................is out of repair (*here state nature and extent of damage*). I therefore beg to call upon you to assist in repairing the same in terms of section 15 of the "Fencing Ordinance, 1904."

Yours faithfully,

F.—Letter calling upon neighbour to pass Mortgage Bond.

Dear Sir,—

I beg to acknowledge your letter of....................(see specimen *C*) and note that you wish to pay your share of the cost of our joint fence by instalments. I am agreeable to this, provided you pass a mortgage bond over your farm in terms of section 29 of the "Fencing Ordinance, 1904" (*or other security can be arranged by mutual agreement*).

Yours faithfully,

G.—Letter to Registrar of Deeds notifying debt owing by neighbour for fencing.

Sir,—

In terms of section 30 of the "Fencing Ordinance, 1904," I beg to notify you of the undermentioned debt incurred in connection with a joint boundary fence between the farms ....and......................, and to request you to register the same in the Register of Deeds.

Name of farm.............................

Amount owing...........................

Situation and name of property in respect of which Bond has been demanded....................

Date of the grant or transfer of the said property to the said person..........................

The above amount has been agreed upon, *or* ascertained according to law, and the person above named has been duly called upon to pass a mortgage bond and has failed to do so.

I am,

Your obedient servant,

FARMING CALENDAR.

February.

BEE-KEEPING.

In most parts of the two Rhodesias this month is one of fair activity for all bees, there being as a rule quite enough nectar, pollen, etc., available for all ordinary purposes of rearing, building cells, etc., and working generally for the due upkeep of the colony for the present as well as for the coming winter. Whether there will be any surplus honey for them to store will depend upon what crops the farmer may have on hand at this time, as the usual flora of the land will not supply it until the regular second flow of the year is due, which should be in March to April, according to the season.

Watch carefully for robbers, though, with well attended hives and due care in handling, there should be little to fear in this direction; strong, well filled hives can always repel robbers, which are only successful with weak colonies, and these no apiarist should ever have under his care. Mark well last month's advice, i.e., to have everything in readiness for dealing with unexpected new swarms that may be required as they may come, for nothing is more disconcerting or annoying than to be unready when the time arrives. This applies especially to any swarms that may come from the apiary, for a few days only of neglect of such a hive may easily lead to the moth taking early possession of the combs, and in practically a few hours destroy fully drawn-out combs that would otherwise be of much value for after working upon. Such combs, as they are available, should at once be packed away in an air- and moth-tight box or tin for after usage.

CITRUS FRUITS.

Newly-planted citrus trees should be kept free of weed growth likely to exclude necessary air and light for their normal and healthy development. Citrus trees planted in February seldom give satisfactory results; late planted trees do not mature their new growths before winter, and they are more susceptible to winter injury or the ravages of disease or insect pests. The early planted cover crops will be fit to plough under by the end of the month. Do not delay this operation for fear of the rains ending abruptly. If this occurs, great difficulties will be experienced when attempting to plough in the green crops. Keep all young shelter belt trees free of weed growth, and loosen the soil round their stems fairly frequently to eliminate possible ant injury. This is one of the best months for budding citrus trees, either in the nursery or grove—trees that are to be top worked to profitable varieties. Late out-of-season fruit that may have set during December-January should be stripped from the trees. This fruit is valueless for export, and if allowed to mature, will affect the main crop setting of fruit.

DECIDUOUS FRUITS.

When sufficiently mature, plough under cover crops. This should be possible towards the end of the month.

Summer pruning should be completed early in the month; little or no advantage will be derived from trees treated when the new wood reaches maturity.

Do not allow fruit to become over-ripe, then expect remunerative prices for it. If it is harvested at the correct stage, then well graded and neatly packed, good prices may be expected for the surplus fruit sold.

This is a good month for budding deciduous fruit trees.

CROPS.

Cultivate, and keep on cultivating as weather permits, to destroy weeds. Continue to look out for stalk borer, and, if infection is discovered, deal with infested plants as advised in January notes. Watch witch weed and continue cultivating and hand pulling it. Plough under witch weed, smother and trap crops. Where practised, maize can be under-planted with sweet potato vines after the last cultivation for the following season's requirements. Potatoes and ground nuts will probably need to be ridged again. Catch crops of quick maturing beans, such as tepary bean, also buckwheat, can still be sown. Keep down all noxious weeds. This work can be undertaken on wet days. Make veld grass hay whenever a few days of fine weather permit. Early mowings provide the best hay. Seed beds of onions for early winter planting can be sown towards the end of the month. Keep potatoes in a cool shed, well ventilated. Pick over any potatoes in storage and remove bad ones. Continue to make as much farm manure as possible. Begin to ride manure and place in heaps handy to the lands to be manured.

DAIRYING.

This is normally the flush season as far as dairy produce is concerned; dairy cattle are usually in good condition and cows of average capacity should be able to subsist and maintain a full flow of milk on veld grazing alone. Calves may be given a few hours' exercise on bright, sunny days; young stock, however, should not be allowed to run and graze with the herd, and are best kept in a cool, airy pen opening on to a small shady paddock, where they can obtain a little exercise.

A good quality of sweet hay and water should always be available for young calves.

Cream deteriorates very rapidly under the conditions which obtain at this time of the year, so that every precaution should be taken to keep the cream as cool as possible pending despatch to the creamery. As there is a greater strain than usual on the separator during the flush months, frequent oiling is necessary, and care should be taken that the machine is mounted on a level foundation. The separator and all other dairy utensils must be cleaned immediately after use. First rinse the utensils with cool or lukewarm water, then wash thoroughly with boiling hot water, washing soda and a scrubbing brush; scald finally with boiling water.

The cheese in the storeroom is apt to develop mould during wet weather. If the cheese is well made and pressed and has a smooth rind, this mould is merely superficial and will not penetrate into the body of the cheese. Rubbing the cheese with a cloth moistened with a weak solution of formalin or permanganate of potash usually checks the development of mould. During these months care must be taken not to use over-acid milk for cheesemaking, and great care should also be taken of the starter. If this latter shows any signs of gasiness or develops any disagreeable flavour or odour it should be discarded and replaced by a fresh, clean starter. The cheese storeroom must be kept dark and flies excluded.

ENTOMOLOGICAL.

Maize.—The first brood of the stalk borer matures this month, and the young of the second brood may be found amongst the younger leaves. Weeds should be kept down.

Tobacco.—Stem borer, leaf miner and budworms are the chief pests likely to be troublesome. Plants in the field found infested with the first two insects should be heavily pruned or destroyed. The budworm caterpillars can usually be hand picked during the process of topping. (See "Rhodesia Agricultural Journal," December, 1927.)

Potato.—Ladybirds and tuber moth may call for attention. The latter, when very bad, sometimes causes considerable wilting of the crop besides attacking tubers. The ladybirds may be destroyed by spraying with arsenate of lead 1 lb. to 16 gallons of water.

Cabbage Family.—All members of the family are liable to be attacked by the sawfly and webworm. The sawfly may be effectively controlled by dusting during a dry spell with Paris green and slaked lime (1 lb. Paris green and 20 lbs. slaked lime).

Melon Family.—The most important pest is the melon fly, which "stings" the fruit of all species of gourds. Destroy all badly "stung" fruit and spray remainder thoroughly with arsenate of lead (2 ozs. in 4 gallons of water) to which 2½ lbs. of cheap sugar has been added.

Deciduous Fruit.—Apples, pears and late peaches suffer chiefly from fruit moths, which puncture the fruit. No remedy available except covering the trees with netting.

Fig.—The fruit is liable to the attack of the fig weevil. All infested fruit and all wild fruit should be collected and destroyed. The borer in the stem may be killed by inserting a little carbon bisulphide into the burrow and sealing it up.

Poison Baiting.—Poison baiting against surface beetles, cutworms, etc.: No really effective bait has yet been discovered for cutworms, but the following poisoned bait is recommended for surface beetles, etc.: Paris green 1 lb., 180 lbs. maize meal. Mix thoroughly in dry state and add water until the material is of the consistency of a dough. Roll into small balls and place under shade. Spread in the evening.

FLOWER GARDEN.

Sow carnations, phlox, pansy, verbena, gilias, larkspur, dianthus and pentstemon. The flower garden should be now looking its best, nearly all plants being in bloom. Old and dead flowers should be constantly removed, except when the seed is required. Seeding of the plants shortens their flowering period. All runners and climbers should have constant attention, and be tied up and trained, otherwise they will be damaged by the wind. Dahlias, chrysanthemums and carnations will require staking, as they become top heavy when in flower. Make the first sowing of winter-flowering sweet peas.

VEGETABLE GARDEN.

Sow now—Beans, beet, cabbage, cauliflower, lettuce, peas, onions, carrots, parsnips, turnips, endive, kohl rabi, rhubarb and all herbs.

FORESTRY.

Tree planting operations should be carried out on dull, showery days or late in the afternoons. Take care in setting out the plants, avoid bending the roots, and do not plant deeper than the plants were in the seed beds or trays. Steps should be taken to prepare seed beds for the slower growing species, i.e., pines, cypresses and callitris, and seed of these species should be sown for the following season's planting.

GENERAL.

This is a busy time for the farmer. Weeds will be very much in evidence and difficulty will be experienced in keeping them under. Stock will have fully recovered their condition, but ticks will be troublesome. The dipping tanks must be fully utilised now.

POULTRY.

Cockerels for future breeding should now have been selected, and those not good enough sold for killing. It pays far better to get rid of all of the latter, even if only at 1s. or 1s. 3d. per lb., than to keep them on, eating their heads off, in the hope of getting a better price. Those good enough for breeding, and they must be good, should be kept till about June; there is a demand for such up to this month. Any surplus at this time should be eaten or sold for what they will fetch. Of those selected for breeding purposes, the owner should keep the best one or two for his own use, with another as a reserve. No poultry keeper should sell his best stock, no matter how high a price is offered for it.

By the end of this month the birds selected for breeding should be mated up. If it is possible, the birds selected for breeding should be given a run on free range for three weeks or so before being put into the breeding pen and fed sparingly; better fertility and better chicks will be the result. If it is possible to run the birds selected for breeding away from the others during the whole of the breeding season, all the better. Any hens that become broody should be kept broody by setting a few china eggs under them until such time as eggs from the breeders come in. Broody hens at this time and for the next five months are valuable.

During the rainy season the scratching litter must be kept dry; if it gets wet it is useless.

Duck hatching can be continued all the year round; the main points are that the young ducks must be kept out of the sun and sleep on dry grass. Nothing is more fatal to ducklings than sun, and dampness at night; and the latter applies, too, to the adults. Unless a dry shed, with a dry, soft layer of chaff or sand, etc., covering the floor of it, is available, it is not wise to hatch turkeys till after the wet season is finished, for it will be labour, food and eggs wasted. If the young turkeys get wet they are almost certain to die. This and the feeding on wet mashes instead of dry food, chopped onions and thick milk are the chief reasons for non-success in the breeding of turkeys.

STOCK.

Cattle.—The recommendations for December apply equally to this month. Be careful that the condition of the bulls is maintained, especially in the case of well-bred animals. A bull in poor condition cannot be expected to sire a large number of calves. As far as practicable cut veld hay during this month. Usually the optimum relation of yield and composition occurs now. During this month, in addition to maize, some protein concentrate such as peanut cake or cotton-cake will generally be necessary in the dairy cow mixture to keep up a good milk flow. Increase the grain ration to bullocks which are being fattened on grass and add some protein concentrate to their feed to make good the deficiency of this nutrient in the grazing.

Sheep.—Continue as recommended for December. If heavy rains are experienced, a daily ration of half a pound of maize per ewe will help to keep them in condition. Those who favour autumn lambs must put the ram again with the flock in February, and should take steps to supply a little extra feed to fit the ewes for mating. Start putting in green feed for ewes due to lamb in April or May.

TOBACCO.

The early tobacco should now be ready for curing. Care should be taken to select only thoroughly ripe leaf for filling the barns, so that the cured product will be uniform. Topping, priming and suckering should be given attention. Selected seed plants should be carefully watched. New land intended for tobacco next year should be ploughed this month, so that all organic matter turned under may be converted into humus before planting time next season.

WEATHER.

This is often the wettest month of the year, with marked differences of from 10 inches to 15 inches on the eastern mountain ranges, 7½ inches over Mashonaland, 4 inches to 6 inches in Matabeleland, and least, but still some, rains in the Limpopo Valley. The rains may be expected to decrease in intensity after the middle of the month if the season is normal.

March.

BEE-KEEPING.

As the latter end of this month should herald the approach of the second and last real honey flow of the season, see that enough extra supers are ready for placing on hives as required, watching also that the fully drawn out combs of shallow frames that are on hand to fill them with are kept free from the wax moth; further, examine all supers that are already on the hives for this serious defect, though strong colonies will as a rule keep the combs free from this pest. March being usually a hot month, look well to the entrance; enlarge when and where necessary, and have ventilating lids on the tops of each hive. Extra ventilation can be provided for when required by placing small metal or wooden wedges underneath the top super, but not to be open enough to let out or in a single bee. Where quilts are noticed to have been eaten or more or less destroyed during the summer months, now is the time to make fresh ones so as to be ready for the closing down and the making snug of each hive when winter approaches; old flour bags or old deck chair canvas make capital quilts. Bees during this month will consume a quantity of water; see that some is always kept in the apiary in floating cork chips. This will save much labour and flight for them, as well as prolong their period of work and usefulness. As stated in last month's notes, flying swarms may be expected now any day, so prepare for their capture if required by having all details and items ready for immediate use. It is as well, however, at this date of the season to do without such swarms, unless the owner is prepared to feed them well during the winter months. March or April swarms, unless they are hived under conditions of providing all the frames, of fully drawn out old combs, do not as a rule have either the time or materials to provide for a strong colony before the winter sets in, and must perforce remain a weak one during that period. The axiom of every bee-keeper should be to let his colonies go into winter quarters brimming over with bees, not only to provide against the mortality that is bound to occur then, but to have a full hive to start the next season with.

CITRUS FRUITS.

Two thorough sprayings about this season, when the rains are usually practically over, at an interval of about two weeks, will often obviate the necessity for further work against scale insects until the beginning of the next wet season. If not already done, orchards should be ploughed and cross-ploughed and worked up into a really good surface, so that the cultivators can be kept going, say, every two weeks until it is necessary to irrigate, after which cultivation should be continued. If March prove a dry month, orange trees holding up a crop of fruit will probably require irrigation, but under normal weather conditions it should not be necessary. The same remarks apply as last month with regard to fruit moths. About the end of this month fall budding can be taken in hand, that is the insertion of buds that are intended to remain dormant until spring. This applies to higher altitudes, but in low country, where the growing season is extended, dormant budding should not be done until latter end of April.

CROPS.

Watch oats for rust, and, if badly infested, cut crop for hay as soon as weather permits. Ridge late potatoes, and if weather is dry prevent ridges from cracking, to check tuber moth infestation. Finish ploughing under all green manure crops while the ground is still moist enough to promote rapid decomposition. Late in the month begin to cut silage crops and ensile. Cut out barren maize plants and feed to stock or ensile. Cut Sudan grass for hay to permit of final late growth for autumn grazing. Reap any crops that are ready, and plough the stubbles **at once.** Lift ground nuts that are sufficiently matured. Watch for ground nuts making second growth; reap, and when sufficiently dry, place in cocks with nuts inwards and cover the top securely. Sow onion seed beds for winter crop. Watch the weather for hay-making and take advantage of fine spells. Towards the end of the month hay-making should normally be in full swing. Continue to plough all lands in succession immediately the crops are reaped from them. Vleis and irrigable lands should now be ready, or in process of being prepared, for winter crops. Early sowings of Algerian oats, barley or rye for green forage can be made. Allow any potatoes lifted to dry before storing them, but do not leave too long in the sun. Destroy witch weed and other noxious weeds. Continue to make all the kraal manure possible by throwing grass and litter into kraals, yards, etc. Begin to select in the field maize plants for seed purposes, and mark them with slips of coloured cloth. Press on with the breaking up of any virgin land which may have been stumped or cleared earlier in the year. Place orders for grain bags without delay. Early in the month silage pits should be cleaned out or, where necessary, new pits dug.

DAIRYING.

This is usually the most favourable month of the year for dairy operations. Cooler nights are now in evidence, and there is usually little difficulty in maintaining a low temperature in the dairy and cheese-room. If elementary precautions are taken, all cream should be first grade, and first-class cheese should be made, as a gassy condition of the milk is rare. Dairy cows, unless they are very high producers, can go without extra rations, because the grass is now in seed and grazing is ample. The cheese storeroom is generally full of cheese, and care should be taken to turn the cheese regularly. The windows and doors should be opened at night and closed in the daytime. A little mould on the cheese will not affect its quality, but if the mould is excessive the cheese should be rubbed daily.

Calves which are under four months old should be kept in and allowed to nibble at well-got hay; at the same time a little dry mealie meal and monkey nut cake will do them good and teach them to eat concentrates. An ample supply of clean water should be provided in the calf run.

ENTOMOLOGICAL.

Maize.—The stalk borers of the second brood may now be found in the stalks, but nothing can be done at this stage. Caterpillars sometimes attack the crop as a sequel to cultivation after grass weeds have made too much growth. The caterpillars attack the crop on account of their more natural food being suddenly destroyed. Prevention and not cure is indicated.

Tobacco.—The crop will by this time mostly have outgrown insect injury, but leaf miners and budworms may be in evidence. The latter are usually destroyed by hand when topping. Any plants affected with stem borer should be removed and destroyed.

Potato.—If ladybird beetles or caterpillars are injurious, spray with arsenate of lead (powder) 1 lb. to 30 gallons of water. Careful hilling should be attended to with the object of preventing and checking tuber moth attack.

Vegetable Garden.—If sawfly attacks plants of the cabbage family dust with Paris green 1 lb., fine sifted slaked lime 20 lbs. Against cabbage louse (aphis) wash plants frequently with a strong spray of water. Destroy blister beetles by hand. Plants of the melon family may be baited regularly with arsenate of lead (powder) 1½ ozs., treacle ½ gallon (or cheapest sugar 2½ lbs.), water 4 gallons, to keep down fruit flies. For leaf-eating caterpillars and beetles, etc., spray with arsenate of lead (powder) 1 lb. in 30 gallons of water on foliage which will retain water. Cabbages are best dusted.

Citrus Trees.—Collect and destroy infested fruit to keep down citrus codling. Fruit-piercing moths sometimes attack the fruit during the month, especially navels. They work at night and can only be dealt with at present by hand destruction. The trees should be watched for development of aphis and soft brown scale on the young growth and prompt measures taken. Resin wash at two-thirds standard strength is suitable.

Mosquitoes, House Flies, etc., may be very prevalent during March. Destroy breeding places. Poison or trap adult flies. Attend to screening of residence.

FLOWER GARDEN.

Flower seedlings for winter blooming should now be coming on, and should be planted out during showery or cloudy weather. Cuttings of carnations may now be made, and should be taken from selected plants which have borne the choicest blooms. The cuttings should be dibbled in half paraffin tins containing three parts sand to one of loam, and kept in a moist condition in a shady position sheltered from the winds. Make main sowing of winter-flowering sweet peas in a well-prepared and rich soil.

VEGETABLE GARDEN.

The sowing calendar is the same as that recommended for last month. Plant out from seed beds cabbage and cauliflower; care should be taken during this month, as the end of the rainy season approaches, to dig with a fork all the ground in the garden. The heavy rains settle this down hard, and as soon as the dry weather begins the soil cracks and lets out all the sub-soil moisture by evaporation. As soon as the rains cease entirely it is advisable to go over the ground and fine down with a rake, leaving some three or four inches of quite fine soil to act as an earth mulch.

FORESTRY.

Cultivation where necessary should be undertaken between the rows of trees planted out in previous months. If cultivation is carried out with the hoe, care should be taken not to pile earth round the base of the stems. New ground for next season's planting should be roughly broken up with the plough. Bulk plantings may be proceeded with during the month.

GENERAL.

At this time the condition of stock on the veld is usually good. It is well, however, to look ahead and make ready for the coming winter by the provision of winter feed in such forms as veld hay, silage, baled fodder from maize, manna, oats, teff, velvet beans, and the like, and by taking steps to ensure that water will be available for the stock in winter as near their grazing ground as may be.

POULTRY.

The breeding pens should have all been mated up by now, as the first chicks should he out by the beginning of April. Much more care should be used than is usually the case when selecting birds for breeding. Only the very best, i.e., the strong, healthy, vigorous ones from the best layers, should be chosen. A pamphlet on "Selection and Mating for Improvement" can be obtained on application to the Editor or the Poultry Experts. This deals fully with the subject. Always keep an eye on the male bird; many are apt to get thin and run down in health, due to their allowing their mates to eat all the food. Such birds are better breeders than those that chase their mates away from the food. Every male that is being bred from should be given a good meal by himself each day, to ensure health and vigour. The incubator should be thoroughly overhauled, cleaned and disinfected before the eggs are put in.

STOCK.

Cattle.—Arrangements for winter feed should be pushed on. For a well balanced winter ration, in addition to good quality veld hay, a succulent feed such as maize silage, majordas or pumpkins and a legume hay such as velvet beans, cowpeas or dolichos beans are essential. The milk supply will begin to decrease. In the case of cows rearing calves it is often good policy in this month to cease milking the cows and to allow the calves to get all the milk from now on. Slightly increase the amount of grain to the dairy cows and increase the proportion of protein concentrate in the dairy cow mixture to make good the usual loss of feeding value in the grass. Bullocks fattening on grass will do better for a daily ration of some succulent feed such as green mealies or sweet potato tops.

Sheep.—Grass seed may be very troublesome. Keep the sheep on short grazing, or, alternatively, put them on to grazing which has been mown. Crutch the ewes due to lamb.

TOBACCO.

All late plants should be topped low to hasten maturity. The bales of cured leaf should be examined to ascertain whether or not the tobacco has been baled in proper condition. Seed heads should receive continued care. Land ploughed during February should be disced and rolled to assist the decomposition of organic matter. Tobacco fields already cleared of plants should be immediately ploughed. Tobacco bulks should be examined and turned, if necessary.

WEATHER.

Rains may be looked for in considerable quantity, though less than in previous months, 5 inches in Mashonaland and 3 inches in Matabeleland being normal, with as usual more on the eastern frontier. No useful rain need be reckoned upon after the end of this month, except on the eastern border, but the rainy season tapers off in an irregular and often erratic manner and without certainty.

SOUTHERN RHODESIA VETERINARY REPORT.

November, 1931.

AFRICAN COAST FEVER.

Melsetter.—No cases occurred on the infected farm Hillside.

FOOT AND MOUTH DISEASE.

Chibi District.—In the Lundi Reserve, adjoining the Selukwe district, some infection was found in the Shiku and Matenda dipping tank areas amongst herds that had not been infected previously. Dipping has been resumed in this district, and if there are any other herds in a similar position it is hoped that contact at the dipping tanks will result in their contracting the disease at an early date and thus leave no susceptible cattle for the slow perpetuation of infection.

Victoria District.—Three fresh centres of infection were discovered, viz.: on Townlands Farm, the Chikwauda Native Reserve and the Gomohuru Leper Settlement. On the first-named the disease manifested itself in a severe form, especially in a herd of pure-bred animals in which the loss of condition was very rapid and severe. In Shumba section of the Victoria Reserve infection has been through all kraals, except a few isolated ones in the south-eastern section and some miles from the nearest infection.

Chilimanzi District.—No fresh outbreaks. Infection active on the farm Driefontein, with severe lesions on the feet. In the Chilimanzi Native Reserve there is still some infection in the Rutunga and Janjuri dipping tank areas, where feet lesions have been very pronounced.

Gwelo District.—No fresh outbreaks. On the previously infected section of Portion of Four Chums, known

as Vigers, the disease was found at some kraals not previously infected.

SELUKWE DISTRICT.—Infection is still active in the Selukwe Native Reserve, but within the cordons. A fresh outbreak occurred on the farm Goli.

BELINGWE DISTRICT.—In the Belingwe Native Reserve north of the Mondi River the disease extended to the northern boundary of the Reserve in the vicinity of the farms Brooklands, Mnene, Mnene Extension and Newcastle, and eventually to the three farms last named. South of the Mondi River infection was located north of the Mwesa Range, and from there it extended northwards along the west bank of the Mondi River to the boundary of the Reserve, and also in the vicinity of Dombe Hill. On the Lou Estate the disease was found in one kraal adjoining the infected farm Newcastle.

BUBI DISTRICT.—Several extensions of infection occurred on Battlefield Block. The disease appeared on the Ntabezinduna Native Reserve, two kraals on the boundary of Battlefield Block being infected. In these areas the form of the disease is very mild and clears up rapidly without any mortality.

GWANDA DISTRICT.—Infection was found around the Siyoka dipping tank on the Tshahezi River and also amongst some cattle on the farm Tygerberg, which had escaped infection when the farm was infected some time ago. The disease also appeared at several kraals on the Msano River, south of Makado Halt. In the Tuli area the following extensions of infection occurred, viz.: (1) at and to the north-west of the Masera dipping tank, (2) ten miles south of the Topore tank east of the Pahzi River, and (3) a solitary kraal west of the Pahzi River within a mile of the Limpopo River. On Liebig's Ranch the only fresh infection was on section 4. A report from the manager of this ranch states that as soon as the rains broke all stock in partially infected mobs on section 9 took the disease very badly and a heavy mortality occurred. In many cases the tongues were swollen to double the normal size and *post mortem* examinations revealed acute septicæmia in the internal organs generally.

SALISBURY AND MAZOE DISTRICTS.—No fresh outbreaks. *Disease active in one centre only, viz.:* the Arden Ranch.

ANTHRAX.

Two cases *occurred in the infected area at* Mtoko and the in-contacts were all inoculated.

TRYPANOSOMIASIS.

Three cases reported in Melsetter district.

SCAB.

One fresh outbreak and two flocks under quarantine in Melsetter district.

IMPORTATIONS.

From the Union of South Africa: Horses 5, *donkeys* 76, sheep 2,230, goats 122.

EXPORTATIONS.

Nil.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

SOUTHERN RHODESIA WEATHER BUREAU.

DECEMBER, 1931.

Pressure.—Barometric pressure was generally about normal.

A moderate low appeared on the south-east coast on the 1st and remained there on the 2nd. On the 3rd it had moved off, leaving a weak equatorial low extending into Southern Rhodesia. A succession of movements then took place with

very weak development until the 9th, when the equatorial low again extended to the south-west coast and swung. On the 10th there was a deep low on the south-east coast, which moved inland, covering Southern Rhodesia and the east of the Union on the 11th. This low remained until the 13th, but weakened. Movements were again very weak until the 26th, when the equatorial low again extended to the south coast. Up to the 29th it was weak, but it deepened rapidly, and on the 31st a very strong development covered the whole Union.

High pressure systems were almost entirely absent. A high appeared on the south-east coast on the 6th and was central for two days. The next high appeared on the south coast on the 23rd and was on the south-east coast on the 24th and 25th, becoming central on the 26th and remaining in evidence for three days.

Temperature.—The mean monthly temperature was normal to slightly below normal.

Rain Periods.—Isolated showers fell on the 1st and showers were fairly general on the 2nd and 3rd; showers continued fairly general in Mashonaland up to the 8th. From the 9th to the 15th isolated showers only were recorded, and numerous showers fell in the north from the 16th to the 19th.

Showers were fairly general from the 20th to the 23rd, but were confined to the north on the latter day. Isolated showers fell from the 25th to the 31st.

Rainfall.—The average rainfall during December was 4.4 inches, or about 1.3 inches below normal; it was rather unequally distributed as follows:—

	Rainfall, Dec., 1931.	Per cent. normal.
Zone A	3.5	61
Zone B	2.1	50
Zone C	5.3	87
Zone D	7.7	114
Zone E	4.4	74
Zone F	8.5	104

DECEMBER, 1931.

Station.	Pressure Millibars, 8.30 a.m. Mean.	Pressure Normal.	Temperature in Stevenson Screen ° F. Absolute Max.	Absolute Min.	Mean Max.	Mean Min.	Mean ½ Max. ½ Min.	Mean Normal.	Mean Dry Bulb.	Mean Wet Bulb.	Rel. Hum. %	Dew Point F.	Cloud Amt. 0-10	Precipitation Ins.	Precipitation Normal.	Precipitation No. of Days.	Altitude (Feet).
Bulawayo ...	867.7	867.2	91	51	84.2	60.1	72.2	71.7	71.9	62.4	58	56	4.5	1.39	5.2	8	4,436
Gwelo	861.7	...	90	51	82 3	58.7	70 5	71.9	70.5	62.9	66	58	4.9	1.34	6.0	5	4,632
Riverbank ...	...	...	95	54	87.0	61.2	74.1	74.8	73.7	64.7	61	60	...	4.66	5.8	6	4,100
Essexvale ...	...	...	99	53	89.8	62.0	75.9	74.6	71.9	64.1	65	60	.	1.44	5.4	5	3,828
Gwanda ...	909.6	...	97	56	87.8	63.3	75.6	...	76.0	64.0	51	57	3.9	0.83	4.6	5	3,235
Mazunga ...	...	946.6	...	...	...	...	...	78.4	...	...	...	...	...	...	3.7	...	1,970
Nuanetsi ...	...	...	101	56	90.6	63.9	77.3	..	77.1	70.1	71	67	3.1	3.93	3.3	5	1,630
Between Rivers	...	...	87	55	82.1	61.5	71.8	...	70.1	65.3	77	63	6.5	4.94	6.8	18	3,970
Enkeldoorn ...	...	...	86	52	79.8	58.9	69.4	70.7	69.2	62.5	69	59	5.3	3.61	6.5	8	4,720
Gatooma ...	...	...	91	54	86.0	60.8	73.4	74.2	73.2	66.2	69	63	5.9	3.57	7.0	12	3,850
Miami	...	...	85	59	78.3	62.3	70.3	...	69.9	65.3	78	62	...	9.44	5.9	18	4,090
Salisbury ...	854.1	854.4	84	53	78.4	59.8	69.1	69.6	68 8	62.2	69	58	6.7	4.18	6.7	12	4,865
Sinoia, Citrus ...	...	...	...	57	...	62 5	...	...	70.9	65.9	77	63	...	4.73	...	10	3,830
Sipolilo... ...	...	...	84	58	78 2	62.5	70.4	...	70 5	64.8	74	62	6.6	11.59	6.1	20	3,900
Juliasdale ...	...	...	79	44	71.8	54.3	63.1	63.8	65.8	60.5	74	57	...	10.55	8 8	18	6,070
Mtoko	...	...	86	56	79.6	61.7	70.7	...	70.9	64.7	72	61	6.6	7.24	6.6	14	4,210
Shamva ...	...	...	89	60	82 8	64.5	73.7	...	73.8	68.1	74	65	...	11.50	7.0	16	3,170
Angus Ranch ...	...	...	98	60	89.1	67.6	78.4	78.3	77.8	70.1	68	66	...	3.27	4.6	11	2,300
Craigendoran ...	...	...	95	58	87.3	63.5	75.4	...	76.9	68 5	65	64	...	6.19	7.4	9	3,430
New Year's Gift	...	...	96	55	84.2	63 0	73.6	...	73.4	66.8	71	63	...	6.99	5.9	13	2,700
Nyamasanga ...	...	...	84	47	77.5	55.0	66.3	...	68.0	62.4	73	59	...	5.62	...	16	5,080
Riverdene North	...	...	94	52	85.4	60.0	72.7	...	71.8	65.1	70	62	...	3.12	5.0	7	3,700
Stapleford ...	...	...	80	47	71.2	55.4	63 3	...	65.1	60.8	76	58	6.1	12.39	10.8	19	5,450
Umtali	891.8	891.9	89	54	80.2	62.1	71.2	71 9	71.8	65.4	71	62	5.6	6.38	4.8	15	3,677
Victoria ...	894.9	893.8	93	51	84.1	60.5	72.3	73.0	69.3	...	...	...	4.5	0.14	5.2	3	3,570
Melsetter ...	849.6	...	83	52	75.2	57.1	66.2	...	67.6	61.7	71	58	4.2	9.44	7.7	14	5,060
Mount Selinda	...	...	86	55	77.2	61.5	69.4	...	70.1	64.8	75	62	...	9.70	8.9	14	3,520

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REPORTS ON CROP EXPERIMENTS.

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